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Knowledge for the People:

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OR, THE PLAIN
WHY AND BECAUSE,

FAMILIARIZING SUBJECTS OF USEFUL CURIOSITY AND
AMUSING RESEARCH.

BY JOHN TIMBS,

Editor of 'Laconics:' 'Arcana of Science and Art,' &c.

"Its beginning is pleasure, its progress knowledge, and its objects truth and utility."—*Sir Humphry Davy.*

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KNOWLEDGE FOR THE PEOPLE:

OR THE

PLAIN WHY AND BECAUSE.

PART I. — DOMESTIC SCIENCE.

DOMESTIC SCIENCE.

ILLUSTRANS COMMODA VITÆ
Motto of the Royal Institution.

FIRES.

Why are coke and charcoal fires free from smoke?

Because the moisture has been previously dissipated; this moisture producing the smoke of coal fires.

Why does too much coal on a fire cause the chimney to smoke?

Because, when the heat begins to operate on the coal, gas is extricated; this gas carrying some of the grosser particles along with it, a heavy smoke is thrown out, which will not rise in the chimney, but by its own gravity is forced back into the room; on which the warm air of the apartment being lighter than what comes in, instantly ascends towards the ceiling, and the lower part becomes cool. But if a portion of the fuel is taken off, then the small quantity of active caloric, or heat, acts with greater force on the unconsumed coal, brings out its latent or inactive heat more rapidly, and thereby producing a quicker decomposition of the gases, by the increasing combustion, the smoke becomes thinner and lighter, and though it carries up certainly more caloric with it proportionally than before, yet the quantity of radiant heat is greater, and the temperature of the apartment is more equalized.

Why do some chimneys smoke?

Because the wind is too much let in at the mouth of the shaft, or the smoke is stifled below; or there is too little room in the vent, particularly where several open into the same funnel. The situation of the house may likewise affect them, especially if backed by higher buildings.

Why is a common coal fire often extinguished long before the fuel is all expended?

Because the fire or flame *left to itself* is so small that it does not produce heat enough to maintain the inflaming temperature of the substance; and the remnants are not gathered together to reduce the surface of wasteful radiation.—*Arnott.*

Why does water thrown on a brisk and flaming fire apparently increase the combustion?

Because the water is converted into steam, which expanding and mixing with the flame, causes it to spread out into a much larger volume than it otherwise would have occupied.—*Arnott.*

Why does sunshine extinguish a fire?

Because the rays engage the oxygen which had hitherto supported the fire.

Why does a fire burn briskly and clearly in cold weather?

Because the air being more dense, affords more nourishment to the fire.

Why is it wasteful to wet small coal?

Because the moisture, in being evaporated, carries off with it, as latent, and therefore useless, a considerable proportion of what the combustion produces. It is a very common prejudice, that the wetting of coal, by making it last longer, effects a great saving; but, in truth, it restrains the combustion, and for a time makes a bad fire; it also wastes the heat.

Why does a poker laid across a dull fire revive it?

Because the poker receives and concentrates the heat, and causes a draught through the fire.

Why do vegetable stalks, &c, burn briskly?

Because of the quantity of carbon which they contain.

Why does flour of sulphur thrown into a fire-place extinguish a chimney when on fire?

Because, by its combustion, it effects the decomposition of the atmospheric air, which is, consequently, annihilated.

Why do certain furnaces consume their own smoke?

Because the smoke or flame of fresh fuel, on its way to the chimney, passes through, over, or among, fuel, which, having already been converted into coke or charcoal, had ceased to smoke; by which expedient the grosser parts of the flame or smoke are consumed, or converted into pure flame, free from smoke.

Why do we prevent a nuisance and effect a great saving by destroying or burning smoke?

Because coal containing much hydrogen, as all flaming coal does, is used wastefully when any of the hydrogen escapes without burning: for, first, the great heat which the combustion of such hydrogen would produce is not obtained; and, secondly, the hydrogen, while becoming gas, absorbs still more heat into the latent state than an equal weight of water would, Now the smoke of a fire is the hydrogen of the coal rising in combination with a portion of carbon. — *Arnott.*

Why are strong flames often seen at the chimney-top of foundry furnaces?

Because the heat of the furnace is so great that the smoke burns on reaching the oxygen of the atmosphere.

Why is it evident that coal is derived from vegetation?

Because there are few coals but that present more or less of a woody texture: to be traced from the bitumenized wood, which still bears, though approaching in its nature to coal, the trunk, the branches, and even the very leaves of trees, through all the varieties of coal, into the most compact slaty kind, of the oldest formation.—*Bakewell.*

Why is charcoal sometimes found among coal?

Because the slate which covers the coal layers takes fire, in consequence of its containing sulphur, in such minute division, as readily to attract oxygen and inflame; thus converting vegetable remains into charcoal.*

Why are charcoal and coke obtained in closed vessels?

Because the wood and coal from which they are obtained, if similarly heated in the air, would burn or combine with the oxygen of the air; but heated in a vessel or place which excludes air, they merely give out their more volatile parts.

Why do fatal accidents happen from the burning of charcoal in chambers?

Because of the abundance of carbonic acid gas extricated during the combustion.

Why are the insides of water casks charred, or slightly burned?

Because the charcoal thus produced in the casks, keeps the water sweet, and, in some measure, preserves the wood from the influence of damp.

Why are long, shallow stove-grates, uneconomical?

Because the body of the coal is not soon heated, and requires to be oftener replenished, to keep up the fire.

Why is the extreme heat of stoves for heating rooms, pernicious to health?

Because, if the temperature be thus raised much higher than 300° Fahrenheit, the animal and vegetable matter, which is found mechanically mixed at all times with the air, will be decomposed, and certain elastic vapours and fluids produced, of a deleterious quality, and peculiar smell. The matter here alluded to is very visible to the naked eye in a sunbeam let into a dark room.

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* This curious fact is recorded by Dr Richardson, the naturalist, in Franklin's Expedition of Discovery, respecting the shale on the coasts of the Arctic Sea. This shale composed precipitous banks, which, in many places, *were on fire.*

Why do flint and steel when struck together produce a shower of sparks?

Because small portions of one or both are struck off by the violence of the collision, in a state of white heat, and the particles of the iron burn in passing through the air: in a vacuum the heated particles are equally produced, but are scarcely visible from this combustion not occurring. In both cases they suffice to inflame gunpowder, or to light tinder.

EFFECTS OF HEAT.

Why do we stick a pin in a rushlight to extinguish it?

Because the pin conducts away so much heat that the tallow will not melt, or rise in the wick.

Why does the heater of a tea-urn soon change when placed near the water?

Because it parts with its heat to the water, until both are of the same temperature.

Why are meat screens lined with tin?

Because the polished metal reflects the heat upon the roasting meat, and thus expedites the cooking, independently of the screen itself protecting the joint from currents of air. On this account, screens, entirely of tin, are calculated for expeditious cookery.

Why will that part of the curtains of a room which has been exposed to the sun, be often faded, while those parts which have not been so exposed retain their original colours?

Because the oxygen which existed in a solid form in the dye of the curtains, will be rendered aëriform by the rays of the sun, and will go off in the state of oxygen gas.

Why is a harp or piano-forte, which is well tuned in *a morning drawing-room, not perfectly in tune when a crowded evening party has heated the room?*

Because the expansion of the strings is greater than that of the wooden frame-work; and in cold the reverse will happen. — *Arnott.*

Why are urns for hot water, tea-pots, coffee-pots, &c, made with wooden or ivory handles?

Because, if metal were used, it would conduct the heat so readily that the hand could not bear to touch them; whereas wood and ivory are non-conductors of heat.

Why does a gate in an iron railing shut loosely and easily in a cold day, and stick in a warm one?

Because, in the latter, there is a greater expansion of the gate and railing than of the earth on which they are placed.

Why are thin glass tumblers less liable to be broken by boiling water, than thick ones?

Because the heat pervades the thin vessels almost instantly, and with impunity, whereas thicker ones do not allow a ready passage of heat.

Why will a vessel which has been filled to the lip with warm liquid, not be full when the liquid has cooled?

Because of the expansion of the fluid by heat. Hence some cunning dealers in liquids make their purchases in very cold weather, and their sales in warm weather.

Why is a glass stopper, sticking fast in the neck of a bottle, often released by surrounding the neck with a cloth taken out of hot water, or by immersing the bottle up to the neck?

Because the binding ring is thus heated and expanded sooner than the stopper, and so becomes slack or loose upon it.

Why does straw or flannel prevent the freezing of water in pipes during winter?

Because it is a slow conducting screen or covering, and thus prevents heat passing out of the pipe. By the same means the heat is retained in steam pipes.

Why have ice-houses double walls, and why do wine-coolers consist of double vessels?

Because air fills the intervals between the walls or vessels; or in some cases the space is filled with straw, sawdust or charcoal, all which are non-conductors of heat.

Why have some houses double windows?

Because the air inclosed between the two windows greatly prevents the escape of heat which is produced within the house in winter. Thus, air is an imperfect conductor of heat. Houses which have double windows are likewise more quiet than others, from the air being also a bad conductor of sound.

EVAPORATION.

Why is a decanter of cold water when brought into a warm room, speedily covered with dew?

Because the temperature of the decanter is lower than that of the air immediately around it. The dew may be wiped off again and again, but will be constantly reproduced till the temperatures are equal. Upon this principle, the most convenient sort of hygrometer, or instrument for measuring the quantity of vapour in the atmosphere, is constructed.

Why are porous vessels used for wine-coolers?

Because, being dipped in water, they imbibe a quantity of it, which gradually evaporates; and, as a part of the heat necessary to convert the water into vapour will be taken from a bottle of wine placed in it, the wine is considerably cooled.

Why does the breath or perspiration of animals (of horses in particular, after strong exertion,) become strikingly visible in cold or damp weather?

Because the vapour (invisible while at a higher temperature) is thickly precipitated, by the air with which it is mixed being too cold to preserve it invisible.

Why is profuse perspiration so cooling to labouring men, and all evaporation productive of cold?

Because of the necessity of a large quantity of caloric being combined with fluids, to convert them into vapour or gas.

Why do persons take cold by sitting in wet clothes?

Because they suddenly lose a large portion of heat, which is carried off from the body by the evaporation of the water from the clothes.

Why, in hot countries, do persons continually throw water on curtains which there form the sides of apartments?

Because the evaporation of the water absorbs a vast deal of heat, and makes the apartments cool and refreshing.

Why are assembly-rooms ventilated?

Because of the motion produced by the changed weight of air, when heated. The air which is within the room becomes warmer than the external air, and the latter then presses it at every opening or crevice to displace the former.

Why does the sulphuric acid in fire bottles so often fail in igniting the matches?

Because the acid is continually attracting moisture from the air, owing to the imperfect manner of closing the bottles.

WATER.

Why do fluids always accommodate themselves to the shape of the vessels which contain them?

Because fluids want cohesion among their parts, whence they are incapable of assuming any particular form without external support.

Why is water never found of the highest purity?

Because all natural waters are constantly coming into contact with some substance which they either dissolve or hold in suspension, arising from the great range of the affinity of water, and its peculiar action as a chemical agent.

Why is lime most generally contained in natural waters?

Because there are few springs which, during some part of their subterranean course, do not come in contact with calcareous earth, and there is no substance which appears so readily soluble in a variety of menstrua. The presence of lime uncombined in any natural waters is, however, conjectural.

Why is rain-water generally impure when collected in large towns?

Because it acquires a small quantity of sulphate of lime, and carbonate of lime, from the mortar of the roof, and plaster of the houses.

Why are ice and snow waters of superior purity?

Because they contain no gas or air, or saline substances, such having been expelled during freezing.

Why is the taste of common water pleasing and refreshing?

Because of the gases (carbonic acid and common air) which it contains.

Why does the best water exhibit the greatest number of air bubbles, when poured into a glass?

Because it contains the greatest quantity of carbonic acid gas, in addition to its proportion of atmospheric air.

Why do air bubbles in a glass of water dilate as they rise from the bottom to the surface?

Because the pressure of the liquor becomes less and less upon them.

Why is some water hard?

Because it contains calcareous salts, with carbonate and sulphate of lime; one grain of the latter, contained in 2,000 grains of soft water, being sufficient to convert it into the hardest water that is commonly met with. — *Brande.*

Why is hard water subject to become putrid, and generally turbid?

Because of the vegetable or animal matter which it contains; and from the suspension of earthy impurity; when drank, it is flat, from the absence of air. — *Brande.*

Why does potash or soda render hard water soft?

Because a decomposition is thus effected, and the carbonate of lime, a very insoluble salt, precipitated.

Why is hard water ill adapted for washing?

Because it contains sulphate of lime, which, by a double decomposition, separates the materials of soap

Why is river water much softer and more free from air and earthy salts than spring water?

Because river water, by the agitation of a long current, and in many cases an increase of temperature, loses both common air and carbonic acid, and, with the last much of the lime or magnesia which it formerly held in solution. The specific gravity hereby becomes less, the taste not so harsh and agreeable; and out of a hard spring, by mere exposure to the atmosphere or the action of the soil, is often made a stream of sufficient purity for most purposes where soft water is required. — *A. Booth.*

Why is the Thames water of such extreme softness?

Because, from observations at and below London-bridge, as far up as Kew and Oxford, it is supposed that the waters seldom change, being probably carried up and down with the turn of the tides for an indefinite period of time.

Why are the objections to Thames water removed by filtration?

Because its impurities have no influence in permanently altering the quality of the water, which is good; and, as they are only suspended, mere rest, especially such as is given by filtration, will restore the water to its original purity.

Why is water raised from beneath the surface of the earth by a pump?

Because the atmosphere presses equally upon the whole surface of the water in the well, until the rod of the pump is moved; but, by forcing the rod down, the bucket compresses the air in the lower part of the pump-tree, which, being elastic, forces its way out of the tree through the valve; so that, when the bucket is again raised, that part of the pump-tree under the bucket is void of air; and the weight of the atmosphere pressing upon the body of water in the well, forces up a column of water to supply its place; the next stroke of the pump-rod causes another column of water to rise; and so long as the bucket fits the pump tree close enough to produce a vacuum, a constant stream of water may be drawn from below.

Why are filtering stones usually made of porous freestone?

Because they are the nearest imitation of the natural process by which the purest waters rise through sand or siliceous rock.

Why is the temperature of cold springs in general pretty uniform?

Because they take their origin at some depth from the surface, and below the influence of the external atmosphere.

Why is the same spring water which appears warm in winter deemed cold in summer?

Because, though always of the same heat, it is in summer surrounded by warmer atmosphere and objects.

Why does not water freeze in pipes two or three feet under ground, when it is frozen in all the smaller branches above?

Because the earth conducts heat slowly, and the severest frosts penetrate but a few inches into it;

while the temperature of the ground a few feet below its surface is nearly the same all the world over.

Why are leaden cisterns unsafe for holding water for culinary purposes?

Because, if the water has stood in them for several days undisturbed, a small coating of white rust may be seen at the upper edge of the water. On every fresh addition of water this rust is washed off; and, if there be the slightest degree of acidity in the vessel, the rust of lead will be dissolved in the water, and thus an insidious poison will be conveyed into the stomach. This rust, or oxyde, as it is chemically called, is produced by the lead combining with the oxygen of the water.

Why are water-pipes, bottles, &c, often burst by water freezing in them?

Because of the expansion of the particles of the water, which, when they crystallize and assume the solid state, unite by certain sides in preference to others, arranging themselves so as to require more space, and having numerous vacuities, the bulk of the whole must necessarily be enlarged.

Why is ice lighter than water?

Because of the air-bubbles produced in the ice while freezing.

Why is soda-water so called?

Because it contains, when well prepared, a very small portion of carbonate of soda, which corrects acidity in the stomach.

Why is soda-water 'from the fountain' inferior to that sold in bottles?

Because the former is merely water impregnated with carbonic acid gas by a forcing pump, and consequently liable to be contaminated by copper, zinc, or lead, according to the vessels in which the condensation is carried on.

Why is it difficult to pour from a vessel which has not a projecting lip?

Because, in pouring water from a mug or bottle lip, the water does not at once fall perpendicularly, but runs down along the inclined outside of the vessel, chiefly in consequence of the attraction between this and the water.

ICE WELLS.

Why is ice broken before it is stored in wells?

Because it may reunite in the interior; in a long frost it diminishes considerably in bulk, as it forms itself into a compact mass, by freezing in the well.

Why should ice be taken from the sides of the well, and the centre left till the last?

Because, if the ice is first taken from the middle, you disturb the body, and the air thus introduced will destroy more than you consume.

BOILING.

Why does water boil in a vessel on a fire?

Because the parts of the liquid next the fire get heated, and rise up through the colder parts which are heavier; and this is found to be the principal manner of communicating heat to all parts of a liquid: for, if the heat is applied at the top, it can only with great difficulty be conducted through the liquid either sideways or downwards; but when applied below, the parts, as they are heated, become enlarged and lighter; they rise to the top, and heat the others in their progress, while those others, being still somewhat heavier, sink down, and are heated fully in their turn. By degrees, the whole liquid gets so hot that the parts next the bottom are converted into steam or vapour, which rises through the rest of the liquid in bubbles to the top, and there flies off till the whole liquid is evaporated.

Why does the spout of a kettle emit a thick cloud or vapour?

Because the steam from the water is then cooled according to its distance from the spout; whereas steam is so transparent as hardly to be seen near the mouth.

Why should a tea-kettle be removed from the fire when the steam from it appears cloudy?

Because the water is then beginning to be condensed, the steam when the water first boils being perfectly transparent.

Why does a kettle containing water, boiling on a fire, in part resemble a still?

Because the water at the bottom of the kettle, or next the source of heat, combines with heat, and forms vapour, which is discharged from the spout in steam. By fixing a long tube of glass or metal to the spout, the steam will be condensed, and drops of water will run from the other end. But the tube which corresponds with the *worm* in the still, becoming as hot as the steam, it can abstract no more heat, and then the condensation ceases. Hence the necessity of keeping the tube cool, which may be done by its passing through cold water. Thus, the whole water in the kettle may be boiled away, but reproduced in the tubes, and collected from it without the loss of a drop. This process is not only the principle, but very nearly the practice of *distillation*, as it is called, and the simple apparatus here described is nearly the model of a *still*. — *Donovan.*

Why should the bottom of a tea-kettle be black, and the top polished?

Because the bottom has to absorb heat, which is aided by rough and blackened surfaces; and the top has to retain heat, which is ensured by polished ones.

Why is a crust so frequently seen on the insides of tea-kettles and boilers?

Because of the hard water boiled in them, which holds in solution carbonate of lime (*see page* 12,) but being long boiled, the latter is no longer soluble, and becomes precipitated.

Why is water, when boiled, mawkish and insiped?

Because the gases which it contained have been expelled by boiling.

Why is hard water by boiling brought nearly to the state of soft?

Because it is freed from its gases, and its earthy salts and substances, by which its hardness was produced, are precipitated.

Why does water, which has been deprived of air by boiling, freeze more readily than unboiled water?

Because of a slight agitation upon its surface occasioned by the attraction of air. — *Black.*

Why should not the water with which gold and silver fish are supplied, be boiled?

Because the water is then deprived of its atmospheric air, and no animals can live in it.

Why is a drop of water tranquil in a very hot silver tea-spoon, and some time in evaporating?

Because of the intervention of a film of vapour, which prevents the contact of the water and the metal, and so interferes with the transmission of heat.

Why is it wasteful to put fuel under a boiling pot, with the hope of making the water hotter?

Because water can only boil, and it does so at 212° of the thermometer.

Why should the pan be uncovered in boiling weak soups?

Because the watery particles then escape more easily.

Why is Papin's digester used in making soups?

Because it prevents the loss of heat by evaporation, and greatly increases the solvent power of water heated in it. Thus, animal bones are dissolved with great facility in these digesters, in order that the gelatine contained in them may be converted into rich soups, &c.

Why do soups, pies, puddings, &c, keep hot much longer than equal bulks of mere fluids?

Because fluids in general transfer heat less readily in proportion as they are more thick; whatever impedes the motion of the fluid particles diminishing the diffusing power.

Why is salt beef reddened by boiling in hard water?

Because of the additional salts which render the water harder.

BREAD-MAKING.

Why is wheat more nourishing than other grain?

Because it contains a larger quantity of gluten, which is an extremely nutritive substance.

Why is rice a good substitute for wheat flour?

Because it contains a great deal of nutriment in a small compass, and does not pass quickly off the stomach.

Why does a stiff dough of flour and water soon turn sour?

Because the water undergoes the acetous fermentation, and becomes vinegar?

Why is yest used in making bread?

Because it lightens it, by inflating the dough in all parts with fixed air, or carbonic acid.

Why is baked bread lighter than dough?

Because part of the water is expelled by the heat of the oven in baking.

Why is brown bread recommended to invalids?

Because it is of an aperient nature, from the bran which it contains possessing a resinous purgative matter.

Why is barley bread much less nutritious than wheaten bread?

Because barley contains much less gluten than wheat; and the nutritiveness of the grain is in proportion to its gluten.

Why is salt used in making bread?

Because of its flavour, and causing the dough to rise better; and its stiffening the clammy dough made from new flour, and giving it a fair colour when otherwise it would be foxy.

Why are there two sorts of crust in a loaf?

Because the *under* surface (or crust) rests on a tile floor of the oven, which being a bad conductor of heat, scorches it very little, but the *upper* surfaces of the loaf being all exposed to the direct influence of the hot air of the oven, are considerably scorched.

Why is alum used in making bread?

Because it is said to whiten ill-coloured flour, and to harden and whiten bread made from flour which has been malted. By fraudulent persons it is used as an adulteration: for a large quantity of it added to the dough enables it to absorb, conceal, and retain much more water than it otherwise would. Bread made from such dough will come out from the oven much heavier than it ought, and the additional weight will be merely water. Two adhering loaves of such bread will generally separate unevenly, one taking more from the other than its share.—*Donovan.*

Why is the fermentation of bread presumed to be vinous?

Because it depends upon the saccharine ingredient of the flour, and the known laws of the decomposition of sugar. The production of spirit, in the course of the fermentation of bread, in baking, which has been found to take place, is perhaps the most irrefragable proof of this theory. Flour kneaded without yest, fermented in the usual way, and enclosed in a distillatory apparatus, has yielded the taste and smell of spirit; and, by repeated rectification, spirit has been thus obtained of strength sufficient to burn, and to fire gunpowder.

MEAT AND SOUPS.

Why is the consumption of animal food so much greater in England than in France?

Because England not only surpasses France in the number of cattle, but the animals are also finer, and their flesh is of better quality; so that the inhabitant of England may consume nearly double the animal substance which France supplies to each of its inhabitants, with the further advantage of better quality.

Why is meat preserved by drying?

Because all bodies, to ferment, must be more or less moist. Thus, a piece of meat, with all its natural juices, will soon putrify; whereas bodies completely dry cannot be made to undergo any kind of fermentation.

Why do smoked provisions keep better than those which are dried?

Because of the impregnation of pyroligneous acid which the former receive from the smoke; turf smoke being generally employed; and turf, by distillation in close vessels, affording pyroligneous acid. — *Donovan.*

Why is a certain soup called Mulgatawney?

Because of its origin from the Indian *mulga* pepper, and *tanee* water; the original soup being merely pepper water, without any meat whatever.

Why is habitual drinking especially fatal to the interests of cooks?

Because nothing so soon destroys the palate or taste, which is necessary even for the most experienced cooks, to ascertain the flavour and seasoning of their soups, sauces, &c.

Why does charcoal prevent meat, &c, becoming tainted?

Because it absorbs the different gases of putrefaction, and condenses them in its pores, without any alteration of their properties or its own.

Why is baking the least advantageous of all modes of cookery?

Because meat thus dressed loses about one-third of its weight, and the nourishing juices are then, in great measure, dried up. Beef in boiling loses 26lb in 100lb; in roasting it loses nearly one-third.

FERMENTED LIQUORS.

Why are some fermented liquors lighter than water?

Because, during fermentation, the heavy saccharine matter gives place to the light fluid alcohol, or spirit.

Why is carbonic acid gas produced in the process of fermentation?

Because in all vinous fermentations a decomposition of the saccharine matter takes place; and a part of the disengaged oxygen, uniting with a part of the carbon of the sugar, forms carbonic acid. A decomposition also of part of the water of solution perhaps promotes the process. — *Parkes.*

Why are liquors cleared by fermentation?

Because, during the process, a thick froth of air bubbles, and viscid matter rises to the surface, and after remaining there some time, it parts with the air which floated it, and the viscid matter subsides to the bottom.

BREWING.

Why is beer believed to be of the same antiquity with wine?

Because the word *beer* seems to be of Hebrew origin: thus, the Hebrew for *corn*, with a very slight modification, sounds like *bre* in *sabre*, or *ber*. The Hebrew language modified itself into the Phœnician, and that again into the Saxon: accordingly the Saxon *bepe*, *barley*, resembles its Hebrew parent: hence we have the English *beer*, the French *bière*, and the Italian *birra*. The Saxon word has been retained in English; for there is a kind of barley called *bere*, or bigge. The English word *beer* was, a few centuries ago, spelt *bere;* and beer has at all times been made from barley; hops are a modern improvement. We may therefore incline to believe, that the etymology of the word not only proves the remote antiquity of the beverage, but traces the invention to the family of Noah.

Why is the month of October an unfit time for brewing, although famous for the manufacture of English beer?

Because in October river water is generally unfit for use, it being then loaded with vegetable decompositions and living animalculæ, neither of which are favourable to the fermentation.

Why does the water of stagnant ponds produce better beer than that of the finest springs?

Because, probably, of its softness, whilst its impurities are separated in the course of the fermentation. —*Neuman.*

Why is water only warm used for the first mashing?

Because it is not of sufficient temperature to dissolve away the coarser and more disagreeable parts of the grain. Hence the first wort from good malt is not only by far the strongest and sweetest, but it is of most delicate flavour, and will produce the nicest drink.

Why is it requisite to stir about the malt and water in mashing?

Because if both remained undisturbed, the malt would subside to the bottom: it would part with its saccharine matter to the water immediately next to it; would saturate it; and, the water thus saturated, being heavier, would remain at the bottom with the malt. This portion of the water could not dissolve any more, consequently, the remainder of the saccharine matter would remain unextracted from the malt, and the upper portion of the water would remain unimpregnated. In large breweries, this stirring is done by rake-machinery. — *Donovan.*

Why is a thin bottomed copper advantageous in brewing?

Because it is much more easily heated, and less liable to wear, than a thick one. The inner surface of the bottom can never be hotter than the fluid it contains: the outer surface is, of course, as hot as the flame which envelopes it. In a liquor copper, therefore, the inside can never exceed the heat of boiling water; and if we could imagine a copper bottom to be infinitely thin, the heat of the side next the fire would be absorbed, by passing through the fire, as fast as it was generated.

Why, in brewing, is it advantageous to cool worts in coolers quite open to the sky, in clear nights?

Because wort is a good radiator of heat, and may thus be cooled eight or ten degrees lower than the temperature of the atmosphere; owing to the rays of heat which, in such a case, radiate from the wort, not being returned again from the clear sky. — *Ency. Brit.*

Why is the cooler generally considerably elevated in a brewery?

Because it is not then overhung by other buildings, that might retard the evaporation, and obstruct the current of air.

Why is rapid cooling important?

Because of preventing the souring, which would certainly take place, if the wort were allowed to remain even at a high temperature, long enough to cool spontaneously.

Why is yest always much more bitter than the fermented wort from which it is obtained?

Because the bitter principle of hops is not very soluble; and during the fermentation of wort, a bitter matter is thrown to the surface, enveloped in the yest, which also rises and eventually remains there. Such is this bitterness, that porter brewers' yest is unfit for the baker, unless it be washed with water: ale brewers' yest answers well for bread; but that of the distillers is the best of all. — *Donovan.*

Why should any particular quantity of yest be determined by weight?

Because the same bulk may consist of more or less real yest, inflated more or less with fixed air.

Why is excessive fermentation injurious to beer?

Because, in proportion as alcohol is evolved, the sugar disappears; the mucilaginous viscidity of the liquor, which depends on the sugar, is lost; and, this once lost, the drink can no longer contain and envelope the carbonic acid, which imparts briskness, sharpness, and creaminess of head.

Why do large tuns of wort sometimes turn sour?

Because the heat spontaneously produced by the chemical changes which take place in so large a quantity of matter is considerable; and this, aided by the occasional excessive heat of the weather, renders the process sometimes unmanageable.

Why is Muscovia glass used by brewers in fining and correcting stale beer?

Because it is a mineral product, containing magnesia, and affording, on boiling, a considerable portion of gelatine. The magnesia neutralises, or destroys, a portion of the acetous acid in the stale beer; and the gelatine carries down with it all the suspended impurities. A pound is said to go as far in fining beer, as two pounds of isinglass.

Why is marble powder the best corrector of sour beer?

Because it generates carbonic acid in such small successive quantities as the beer can readily hold in solution, whilst carbonate of soda generates the carbonic acid all at once. Another advantage is, that when dissolved in the beer by the vinegar present, its taste, being rather bitter, corresponds with that of hops. — *Donovan.*

Why does carbonate of soda restore sour and flat beer?

Because carbonic acid is thus introduced.

Why does small beer soon turn sour?

Because it is the last wort: the saccharine matter diminishing sensibly towards the end, and at last disappearing altogether. Indeed, the last portions of worts often taste sour, when running from the malt. — *Thomson.*

Why will table beer in warm weather burst bottles, while strong ale will not be affected?

Because weak ales undergo a much more violent and unmanageable fermentation than strong ones.

Why is indifferent beer vulgarly called 'Water bewitched?'

Because of an old Scotch custom of throwing a little dry malt and a handful of salt on the top of the mash, '*to keep the witches from it.*'

Why are some drinking pots made with hoops on the outside?

Because formerly the draught of each man in a company was measured by hoops.

ALE.

Why does the peculiar flavour of beer depend upon the water with which it is brewed?

Because of the different substances with which the water is impregnated.

Thus, the prohibitions of the legislature are often set at defiance, or thrown into ridicule: for, while the excise office shall be threatening, or prosecuting, one brewer, for putting a quarter of an ounce of copperas into a barrel of his porter, another brewer, under the survey of the same officer, shall have ten times that quantity dissolved, naturally, in the water which supplies his brewhouse. It is the same with carbonate of lime, common salt, and many other articles, which are strictly prohibited. — *Art of Brewing.*

Why is Cerevisia *Latin for beer or ale?*

Because of its derivation from Ceres, the goddess of corn, from which alone beer was anciently made.

Why is ale so called?

Because of its origin from the Danish word *oela.*

Why is excellent ale to be made with sugar instead of malt?

Because it is the sugar of the malt which undergoes fermentation, and any other sugar will ferment just as well, although no other sugar is so cheap.—*Donovan.*

Why do ale-brewers usually put a handful of hops into the bunghole of each cask, when stowing in the cellar?

Because the atmospheric air is by that means excluded, by the surface of the liquid being covered.

Why was paleness in ales formerly much prized?

Because they were intended thus to imitate the white wines of the Continent.

Why do brewers put crabs' claws, egg shells, &c, into their spring-brewed ales?

Because of the power of those articles to absorb the first germs of the acid fermentation.

Why is strong ale improved by bottling?

Because it retains good body, and unaltered saccharine matter enough to permit a slow and long-continued fermentation; during which time it becomes mellow to the taste, and highly vinous.

Why are certain ales called X X (double X) and X X X (treble X)?

Because, originally, all ale or beer, sold at or above ten shillings per barrel, was reckoned to be strong, and was therefore subject to a higher duty. The cask which contained this strong beer was then first marked with an X, signifying *ten;* hence the present quack-like denominations of XX and XXX.

Why was ale formerly spiced?

Because it was thus not only flavoured, but preserved: cloves are said to prevent ale turning sour.

Why is the manufacture of mead discontinued?

Because of the high price of honey, from the excise duty imposed on it; and the extension of agriculture diminishing the food of bees.

Why are Burton, Nottingham, and other towns on the Trent, so celebrated for their ales?

Because the water with which the ales are made, runs over a rock of gypsum, or carbonate of lime; the hardness of the water being in these, as well as other instances, favourable to the manufacture.

The same brewer cannot, with the same malt, produce an equal beer, in any other part of the kingdom.*

The Barnstaple and Liverpool ales, and some others also of excellent quality, are brewed with hard water. The Derby malt, much used in Lancashire, is found to make better beer in that county than in Derbyshire, and it may be supposed that the Lancashire waters, generally containing much carbonate and sulphate of lime, occasion the difference.

PORTER.

Why was beer first called 'entire,' *and* 'porter?'

Because of the following circumstances.—Before the year 1730, the malt liquors in general use in London were ale, beer, and two-penny; and it was customary for the drinkers of malt liquor to call for a pint, or tankard, of half-and-half, that is, a half of ale and a half of beer, a half of ale and half of twopenny, or half of beer and half of twopenny. In course of time it also became the practice to call for a pint, or tankard, of *three threads*, meaning a third of ale, of beer, and of twopenny; and thus, the publican had the trouble to go to three casks, and turn three cocks for a pint of liquor. To avoid this inconvenience and waste, a liquor was made which should partake of the same united flavours of ale, beer, and twopenny, which was called *entire* or entire-butt; and as it was a very hearty and nourishing liquor, it was very suitable for *porters* and other working people: hence it obtained the name of PORTER.

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* A curious circumstance lately occurred in connexion with one of the able treatises published by the Society for the Diffusion of Useful Knowledge, in 'the Art of Brewing,' the author of which treatise stated that gypsum and chalk were used in the manufacture of Burton ale. The ale-brewers at Burton, conceiving themselves aggrieved by this charge of sophistication, commenced an action against the Society, in the Court of King's Bench. This action was, however, withdrawn, when it was urged by Mr Brougham, that the author of the treatise had stated this as a fact, because he had been unable to prepare ale similar to the Burton, without the admixture of these ingredients. An experienced chemist was subsequently sent to Burton, to whom every facility was afforded by the brewers, and who found that these substances were largely contained in natural solution in the water with which the brewery was supplied, and which takes its rise in a gypsum rock. With an understanding that this explanation should be published in each succeeding treatise, the action was withdrawn by the counsel for the prosecution.

Why are various bitters substituted for hops in porter?

Because the bitter contained in porter is so great, that if taken wholly from hops, it would require an average of ten or twelve pounds to the quarter of malt, or about three pounds per barrel; whereas, by the above means, the brewer can procure as much bitter for sixpence, as from hops will cost him twenty shillings.

Why is quassia a favourite bitter in adulterating porter?

Because the smell, if any, is imperceptible; and the bitter is intense, pure, and lasting, in a quantity of about an ounce to a barrel.

Why is coculus Indicus used by fraudulent brewers in adulterating beer?

Because of its strong narcotic principles. Thus, the berries are sometimes thrown into water for the purpose of catching fish, which, by swallowing them, become intoxicated and stupified.

Why has some porter a close, creaming foam or head?

Because it has the right degree of viscidity, which a due quantity of malt and a proper fermentation always impart.

Why has other porter froth, which, when blown asunder on the surface, does not reunite?

Because it contains *heading stuff*, composed of isinglass and sourish porter whisked into a froth before it is mixed with the beer.

Why is green copperas a harmless addition to produce heading on porter?

Because it is only necessary to dissolve two spoonsful of copperas in each hogshead, which is decomposed as soon as dissolved, as its elements cannot remain in combination at this degree of dilution; and even if it were not decomposed, the quantity of a grain and a half to each gallon, could not have any injurious tendency. — *Donovan.*

Why does porter drink better out of a pewter or tin pot, than from glass or earthenware?

Because of the galvanic influence of the green copperas, (used to give it a frothy top,) and the metal, on the lips; thus forming, as it were, the elements of a galvanic pile.

MALT AND HOPS.

Why is barley superior to other grain for malt?

Because it more readily germinates, and suffers the conversion of its starch into sugar more easily.

Why is barley, prepared for brewing, called malt?

Because it is then mellowed or sweetened, so as to taste something like what the Latins call *mel*, and we term honey.

Why has malt a sweetish taste?

Because, in *malting*, the starch of the grain is converted into sugar during the germination of the seeds.

Why is summer a bad time for malting?

Because the natural heat of the weather, with the heat from the grain in malting, would conjointly produce bitter and comparatively valueless, instead of sweet, malt.

Why does pale malt afford the strongest and best beer?

Because it contains the saccharine principle in perfection.

Why was beer formerly made of a paler colour than at present?

Because it was the practice, instead of using the kiln for drying malt, to spread it out before the sun, which soon dried it, and left it perfectly pale in colour.

Why is wood-fuel objectionable for kiln-drying malt?

Because, during the combustion of the wood, pyroligneous acid is generated, which may communicate acetic acid to the malt, and this may inoculate wort made from it with the acetous fermentation.

Why is high dried malt used for brewing porter?

Because by a brisk heat pyroligneous acid is generated in the malt, without being expelled; and worts made from such malt, will retain a certain sharpness or sourness, sometimes much valued in porter, when not too redundant.

Why should malt be only ground a day or two, before it is wanted for brewing?

Because all sorts of meal are apt to heat by reason of a fermentation that would terminate in putridity.

Why is malt only coarsely ground?

Because it is then less apt *to set*, than if in fine powder.

Why are hops used in beer?

Because the aroma and bitterness of the hop take off the mawkishness of fermented worts, and prevent the beer from becoming sour.

Gervase Markham says: 'The generall use is by no means to put any *hops* into *ale*: making that the difference between it and *beere*, that the one hath *hops*, and the other none: but the wiser husiues do find an error in that opinion, and say that the vtter want of hops is the reason why ale lasteth so little a time, but either dyeth or soureth, and therefore they will to euery barrell of the best ale allow half a pound of good hops.'—*Maison Rustique*, 1616.

Why was a pillow stuffed with hops formerly recommended for easing pain?

Because of the narcotic and stupefying effects of the hops, which soon produced sleep.

Why are hops heavily pressed and closely packed?

Because it is believed to preserve their strength in keeping: if not so packed, they would become damp, and sometimes mouldy.

Why are old hops comparatively of little value?

Because the fine flavour of hops does not exist a twelvemonth. Beyond that time they are *old hops;* and are sold at a cheaper rate to the porter brewer. A year or two longer, and the bitter itself disappears, and the whole becomes nothing better than chaff. The same deterioration takes place when infused in the beer. The flavour is but of momentary duration, and the *bitter principle* gradually decays.

Why were bitters originally introduced into beer or porter?

Because the *leeches* of former times recommended certain plants to be infused in the malt liquor, which herbs were generally the bitterest and most nauseous that could be found; but they cured diseases, and were, therefore, not only tolerated, but sought after; and, in process of time, some of them became necessary to certain tastes, and exist in the beer or porter which we now drink. The general opinion is, that hops were first used to preserve beer from acidity, but bitter ingredients were used by our forefathers, before hops were considered proper for the purpose.

CIDER.

Why is the fermented juice of apples called cider?

Because of its origin from the Roman *sicera,* which colloquially pronounced, is *sidera.* In like manner, perry, or pear water, from the Latin *pyrum.*

Why is common cider rough and sour?

Because the fermentation is complete, and its preparation in this manner, gives so much less trouble.

Why is rough cider stronger than that which is sweet?

Because in rough cider the sugar is all decomposed, and a greater portion of alcohol is produced.

Why is the best cider made from judiciously mixed apples?

Because the requisite qualities of richness, astringency and flavour, are thus obtained, which seldom can be had from one kind.— *T. A. Knight.*

Why do not cider and perry rank as wines?

Because they contain so much malic acid, which is injurious to the fermentation requisite for wine. The acid in the grape is chiefly tartaric.

WINE MAKING.

Why is the manufacture of wine believed to be of high antiquity?

Because Noah, it appears from Genesis ix, 21, became drunk with the produce of his own vineyard; and, as it is reasonable to suppose he was well acquainted with all the discoveries of his progenitors, we may infer that it was not the first instance in which the cultivation of the vine was practised, and the intoxicating quality of the grape experienced.

Why was the invention of wine probably coeval with the grape?

Because the delicious sweetness of the grape juice suggested its separation from the fruit, as a drink, The principle of fermentation is present in the grape: the juice, if kept a few hours, will spontaneously ferment; and the singular appearance of the effervescence, resembling boiling in the cold, would sufficiently stimulate curiosity to complete the process. The enlivening effects of the liquor when vinous, would also assist. It is, therefore, very probable, that wine was discovered nearly 6000 years since, very shortly after the creation of the world.

Why is it probable that wine was the primitive drink of mankind?

Because it is concluded that its name was much the same word as is used to express it by Moses in Gen. ix, 21, from the Hebrew word for pressing out. The similarity of the name in most known languages also favours this conclusion: from the Hebrew word for wine we trace the Greek, and thence *vinum* in Latin, *vino* in Italian and Spanish, *vin* in the French, *wein* in the Gothic, *gwin* in the Welsh, *win* in the Cymbric, *wvin* in the old German, *viin* in the Danish, *wiin* in the Dutch, and *wine* in the English.

Why is wine made by fermentation?

Because the sugar is entirely decomposed, and the only products resulting from it are carbonic acid and alcohol. The changes which take place during this process may be thus briefly expressed: some of the carbon and some of the oxygen combine to form carbonic acid; while the remainder of the carbon, the remainder of the oxygen, and the whole of the hydrogen, combine to form alcohol; the decomposition of the yest amounting to very little.—*Donovan.*

Why does must, or grape-juice, ferment faster in large than small casks?

Because the heat produced in the large cask is so much greater than that in the small. In the large cask, however, there is more loss of alcohol and aroma, upon which the goodness of the wine so much depends.—*Chaptal.*

Why is the treading of grapes essential to a perfect fermentation of the must?

Because when a grape is gently squeezed, the sweetest portion of the pulp only is obtained, and this juice ferments but little; whereas, by increased and continued pressure, the extractive and more acid contents are forced out, and due admixture with the saccharine principles is thereby effected.

Why are white wines prepared from red grapes?

Because the must is separated from the husk of the grape before it is fermented, whence the wine has little or no colour.

Why do red grapes also produce red wines?

Because the skins are allowed to remain in the must during the fermentation, when the spirit dissolves the colouring matter of the husks, and the wine is thus coloured.

Why is not artificial yest added to wine made from grape-juice?

Because a yest exists naturally in the juice, which thus spontaneously enters into fermentation.

Why is wine rolled, and returned on the lees to feed?

Because it renders the wine stronger and better, by re-exciting the languid fermentation. The scum or head is thus broken, and mixed with the fermenting fluid, and a *dry* wine produced.

Why does isinglass added to the wine, prevent its excessive fermentation?

Because it precipitates the yest, and thus prevents it from doing further mischief.

Why is fish-glue, as it is improperly called, also called isinglass?

Because it is corrupted from the Dutch *hyzenblas*, an air-bladder, compounded of *hyzen*, to hoist, and *blas*, bladder; it being chiefly prepared from the sounds, swims, or bladders of sturgeon.—*Booth's Analytical Dictionary.*

Why is tartar procured from vessels in which much wine has been kept?

Because tartaric acid is a necessary substance in all wine; and *must* will not ferment if all the tartaric acid be taken from it, *Why does olive oil, poured in a cask of wine, preserve it in draught?*

Because the oil, spread in a thin layer upon the surface of the wine, prevents the evaporation of its spirituous part, and hinders its mixing with the atmospheric air, which would not only turn the wine sour, but change its constituent parts.

Why does wine crust in the wood?

Because of the constant evaporation, varying according to the wood of the cask, and the surrounding temperature. In casks of chestnut, it evaporates rapidly; in those of mulberry, oak, and other close-grained woods, it proceeds more slowly: it occurs, however, in all of these, which accounts for the vinous odour in a cellar where wines are stored in the wood, however thick the casks, and however carefully they may be bunged.

Why do wines diminish in quantity, but increase in value, by keeping in the wood?

Because the wood allows water, but not spirit, to pass through, or evaporate. Hence wines, by keeping in wood, become more spirituous, and what they lose in quantity they more than gain in quality.

Why does old wine crust in the bottle?

Because the precipitation of the tartar continues in a slight degree even after fermentation, and, in the red wines, generally carries with it a quantity of the colouring matter, forming a dark *crust* on that side of the bottle which happens to be undermost. In white wines, on the other hand, the tartar appears in crystals on the cork and side of the vessel. This precipitation is evidently owing to the more thorough union that takes place between the other component parts of the wine, as it increases in age. The salt is but little soluble in water, and not at all in alcohol. In proportion, therefore, as the alcohol is evolved, and incorporated with the aqueous principle of the wine, this salt is gradually separated in a solid form, bearing with it the other ingredients that may be of equally difficult solution. —*Henderson.*

Why is newly bottled wine or beer laid down, or on the side?

Because the corks are then kept swelled, so that nothing can enter from without.

Why is wine speedily matured by closing the bottles with bladder instead of corks?

Because the bladder permits the evaporation of the watery parts of the wine, but prevents that of the alcohol; hence the strength of wine is improved, and the deposition of the acid salts or *crust* accelerated.

Why are white wines soonest brought to perfection in moderately sized casks?

Because their maturity depends on the concentration of the more solid constituents. For example, two samples of sherry, of the same vintage, were shipped at Cadiz in the same condition, but the one in butt, and the other in half-butt, or hogshead,—the latter on its arrival in England, proved of a more mellow and delicate quality than the former. —*Henderson.*

Why is wine most liable to turn sour in spring and autumn?

Because at those seasons the fermentation is often renewed by frequent and sudden changes of temperature, which cause a corresponding expansion or condensation of the body of liquor, and of the air in the cask.

Why are wines materially improved by a voyage?

Because the heat and agitation of a voyage accelerate the imperceptible fermentation, and ripen wines more speedily.

Why is port wine astringent and slightly rough?

Because of the husks with which it is coloured. The husk is, however, capable of communicating but a light red colour; when the red is deep, it is artificial; and a deep red colour is never a desirable quality. — *Donovan.*

Why is port wine most commonly exported in full pipes?

Because port being of a strong and full body, and containing much mucilaginous extractive matter, the secondary fermentation is quickened by the greater bulk of the fluid, and the wine is thus most effectually mellowed in large vessels.

Why are brandied port wines of inferior quality?

Because the original wines being of inferior growth, would not bear sea-carriage without some preparation, and the shipper is forced to mix them with brandy, which, though it may prevent them from spoiling, renders them otherwise worse than before, as it destroys what little flavour they originally possessed.

Why are first-rate French wines obtained purer than any others?

Because mixing them with inferior sorts would almost entirely destroy the delicate flavours for which they are chiefly prized, and the value of the compound would not compensate the sacrifice it required.

Why does champagne sparkle in the glass, unlike other wines?

Because it is bottled before the fermentation is completed: part of the sugar remains undecomposed, and the fermentation goes on slowly in the bottle till the cork is drawn.

Why are red champagne wines generally inferior to white?

Because the species of fermentation required to extract the colour, dissipates part of the flavour.

Why is champagne, except in cases of weak digestion, one of the safest wines that can be drank?

Because its intoxicating effects are rapid, but exceedingly transient, and depend partly upon the carbonic acid, which is evolved from it, and partly upon the alcohol, which is suspended in this gas, being applied rapidly and extensively to a large portion of the stomach.

Why is claret so called?

Because of its origin from *claretum*, a liquor made anciently of wine and honey, clarified by decoction.

Why do new wines intoxicate more than old wines?

Because the spirit of new wines is not so intimately combined as in old wines, and accordingly exerts its influence more freely.

Why does wine intoxicate less than the quantity of brandy which it would afford on distillation?

Because the brandy is held in chemical combination, and its qualities are modified by the other combined substances. Hence, the effects of spirits are sudden, violent, and transitory; those of wine are gradual, gentle, and lasting. — *Donovan.*

Why is the blackthorn or sloe important in the tricks of trade?

Because, by some knavish dealers, the leaves are used to adulterate and to give a rough flavour to tea; the berries of the sloe likewise enter pretty largely into the composition of much of the wine that is miscalled port.

The following is stated, by a London chemist, to be an analysis of a cheap commodity, sold under the denomination of port wine: spirit of wine, 3 oz.; cider, 14 oz.; sugar, 1½ oz.; alum, 2 scruples; tartaric acid, 1 scruple; strong decoction of logwood, 4 oz.

Why is sugar of lead used by fraudulent dealers to restore some wines?

Because it stops fermentation and putrefaction in the wine, without altering its colour. The sugar of lead might be thus very well employed, if lead and all its preparations were not pernicious to health; as they occasion colics, and even death, when taken internally. Alkalis, as potash and soda, would correct this acidity; but these substances give to wine a dark greenish colour, and a taste, which though not acid, is sometimes disagreeable. Besides, they accelerate considerably the total destruction and putrefaction of the wine. Dr Ure observes, that when wine is sour, 'it cannot, by any good method, be remedied; and that nothing remains to be done with sour wine, but to sell it to vinegar makers, as all honest wine merchants do.'

Why is icing wines a delicate process?

Because every different kind of wine requires a different degree of cold and warmth. Thus, claret, coming immediately out of the cellar, has not that soft and delicious flavour which gives it its peculiar value. The bottle should be placed, before drinking, where it may obtain warmth; in winter before the fire: but Burgundy should be drank fresh from the cellar. Champagne gains strength by cold, but parts with some of its tendency to effervesce, when iced. Sillery champagne is, however, usually drank iced. — *Henderson.*

Why does a quantity of wine diluted intoxicate sooner than the same quantity drank in the same time without dilution?

Because the wine being applied to a large surface of the stomach, acts with proportionally greater quickness: though wine diluted sooner intoxicates, its effects are sooner over. — *Kitchener.*

Why is wine and water called negus?

Because of its origin from Francis Negus, Esq. in the reign of George the First; when a party of Whigs and Tories having assembled to drink wine, fell into a high dispute, and Mr Negus being present, recommended them in future to dilute their wine *as he did:* this suggestion changed the argument to one on wine and water, which concluded by their nicknaming the drink 'Negus.'

Why are wine bottles of a green colour?

Because of the portion of iron in the ashes of vegetables, of which this kind of glass is partly made.

Why is a machine for drawing corks called a cork-screw?

Because it is the thread of a screw without the spindle, and is used not to connect opposing forces, but merely to enter and fix itself in the cork.—*Arnott.*

Why is a cup of coffee beneficial after an excess of wine?

Because it is gently stimulant and tonic, and thus restores the digestive powers which had been debilitated by the wine.

BRITISH WINES.

Why are British wines so little esteemed?

Because of a great radical defect in their manufacture; which is using too small a portion of fruit compared with the sugar employed. It is this circumstance which renders the fermenting process incomplete, and thus imparts that sweet and mawkish taste to our domestic wines, which renders them intolerable to many people, and even to all, perhaps, without the addition of brandy.

Why is tartar recommended in making British wines?

Because none of our fruits contain naturally sufficient tartar for a perfect fermentation.

Why is brandy added to British wines?

Because it is supposed to prevent them from turning sour, and enable them to keep longer; whereas, on the contrary, the brandy decomposes the wine, and although slow, the process is certain.—*Maculloch.*

Why is it recommended to wash the wine vat with lime-water?

Because lime corrects the predominance of acid in English fruits.

Why was the best wine made in England formerly called 'Theologicum?'

Because 'it was had from the clergie and religious men, vnto whose houses manie of the laitie would often send for bottles filled with the same, being sure that they would neither drinke nor be served of the worst, or such as was anie waies mingled or vined by the vintner: naie, the merchant would have thought that his soule should have gone straightwaie to the devil, if he should have served them with other than the best.' — *Holinshed*, i, 282

SPIRITS.

Why are spirits heaviest in winter?

Because they expand, and become lighter by means of heat, in a greater proportion than water.

Why has strong spirit, when mixed with water, a slight milky appearance?

Because of the precipitation of the oil in the spirit.

Why is new spirit better stored in wood than in glass or earthen vessels?

Because wood mellows the raw flavour of the spirit, which glass or earthenware never improves.

Why has all spirit 'a whiskey smell?'

Because of a small quantity of fixed oil from the barley, which it contains.

Why have Irish and Scotch whiskey a smoky flavour?

Because turf is used in drying the malt from which it is distilled.

Why is Ferintosh whiskey so celebrated?

Because all barley produced on the Ferintosh estate was formerly privileged to be converted into whiskey, duty free: consequently, more whiskey was distilled in Ferintosh than in all the rest of Scotland. The word Ferintosh signifies Thane's land, it having been part of the Thanedom of Cawdor (Macbeth's) or Calder. The barony of Ferintosh belonged to the Forbes' of Culloden, and contained about 1800 arable acres. In 1784, Government made a sort of compulsory purchase of this privilege from the Culloden family: the sum paid was 21,500*l.*

Why is the Irish and Scotch spirit called whiskey?

Because of its derivation from the word *usque*, from *usquebah*, the Irish *aqua vitæ.*

Why is some brandy of darker colour than other?

Because of the addition of burnt sugar, or from some matter dissolved away from the timber of the cask which contains it. Pure brandy, like any other pure spirit, has no colour.

Why is French brandy only exported in oak casks?

Because when exported in chestnut casks, although shipped of a strength above proof, it has, when it arrived in Holland or Germany, been found considerably under proof.

Why is spirit of sugar called rum?

Because of its derivation from the last syllable of the Latin word *saccharum* (sugar).

Why is the spirit 'gin' so called?

Because it is flavoured with the berries of the juniper: in Italian, *Ginebro*, or *Ginepro*, or *Ginevro*; and the French *Genèvre* corrupted into our word *Geneva.* The word *gin* is also associated with a name famous in poetry and romance—Ginera, or Ginuera, the favourite lady of Ariosto; which caused him to immortalize the juniper tree, as Petrarch did the laurel.

Why is Kirsch-wasser so called?

Because, in German, it signifies *cherry-water:* kirschwasser being an ardent spirit drawn from cherries.

Why was spirit called 'aqua vitæ?'

Because the old physicians attributed to it the important property of prolonging life.

Why does a piece of potash, dissolving in spirits of wine, prove it to be adulterated?

Because so strong is the attraction of the basis of potash for oxygen, that it thus discovers and decomposes the smallest quantity of water in the spirit.

Why do the workmen employed in cellars and distilleries appear habitually intoxicated?

Because the vapour of alcohol, copiously inhaled in their lungs, produces the same effects as if it had been swallowed. This kind of intoxication is, however, transitory, and disappears when the person is brought into the open air.

Why are deep cellars cool in summer and warm in winter?

Because of the earth conducting heat but slowly, and frosts penetrating it but a few inches.

VINEGAR.

Why is the well-known acid liquor called 'vinegar'?

Because of its derivation from the French *vinaigre*—from *vin*, wine, and *aigre*, sour.

Why is vinegar best made from wine?

Because it contains less glutinous and mucilaginous matter than that prepared from malt or sugar.

Why is French superior to English vinegar?

Because in France vinegar is made from weak wine exposed to air and warmth simultaneously. The superiority of wine vinegar generally, has been just explained.

Why is 'mothering' produced in vinegar?

Because of the vegetable gluten it contains, which then begins to putrify.

Why in making vinegar should the casks be only half filled?

Because a large surface of the liquor may be exposed to the atmosphere. from whence the oxygen is to be derived to acidify it.

Why is vinegar strengthened by freezing?

Because only the weak and watery parts become ice, and the residue is pure acid. Mr Cobbett tells us of a person in America 'who placed several hogs-heads of cider out of doors; the frost turned to ice the upper contents, and a tap drew off from the bottom that which was not frozen. This was the spirituous part, and as strong as the very strongest beer that can be made. The top part, when turned, was weak cider.' — *English Gardener.*

Why is vinegar boiled for pickling?

Because the heat coagulates the impurities, which, when cooled, may be separated by straining.

Why is vinegar (or pyroligneous acid) obtained by distilling wood?

Because the wood chiefly consisting of oxygen, hydrogen, and carbon, in certain proportions, and in a certain state of combination, the elements separate during the heating of the wood, and they recombine immediately after in different proportions, and give rise to new substances. Part of the oxygen and hydrogen combine and form water. Other parts of the oxygen and hydrogen combine each with a portion of carbon, and form two sets of compounds, carbonic oxide and carbonic acid, with carbureted and bicarbureted hydrogen; further portions of the carbon and oxygen, with a very small quantity of hydrogen, then combine, and produce acetic acid. The remainder of the carbon and hydrogen, with a very small portion of oxygen, also unites, and produces a peculiar tar. The water, acetic acid, and the tar, all distil over together, in the form of what is called in common *pyroligneous* acid. The acid which comes over towards the end of the distillation, is the strongest portion; no doubt because the water which the timber contained has been at this time all volatilized. — *Donovan.*

FISH.

Why are salmon and other fish preserved in summer by being packed up in boxes with ice?

Because, although at a certain not very elevated temperature, dead animal substances putrify, when nearly their whole substance rises again to form part of the atmosphere, still, at or below the temperature of freezing water, they remain unaltered for any length of time.

Why are cod-fish, salmon, &c, crimped alive?

Because the crimping, by preventing the irritability of the fibre of the fish from being gradually exhausted, seems to preserve it so hard and crisp, that it breaks under the teeth; and a fresh fish not crimped is generally tough. — *Sir H. Davy.*

Why is cod-fish directed to be boiled in hard water?

Because it hardens, curdles, and keeps the whiteness of the fish, which will cut almost as fine as beef.

Why are trout, salmon, and char, of a red colour?

Because of a peculiarly coloured oil which they contain, and which may be extracted by alcohol; this accounts for the want of it in fish that have fed ill, and after spawning. Sir Humphry Davy gives this explanation, as the result of some experiments, made by an excellent angler, on the fat of fish.

Why do salmon increase much slower than many other fish?

Because they spawn in winter, and the young fry do not come forth till the spring; whereas the ova of some other fish, deposited in summer, become living fishes on the ninth day.

Why are many shell-fish imagined to be poisonous?

Because most shell-fish are indigestible, and from the indisposition caused occasionally by eating them, has arisen the idea of their being poisonous.

Why are not whitebait known in the Thames above Blackwall?

Because they are salt water fish, and come and retire with the water, which is partially salt.

Why is it erroneous to consider the sprat the young of the herring and pilchard?

Because, on comparing a sprat with a young herring of the same length, the sprat will be found to be considerably deeper, and the scales much larger; in this latter circumstance the sprat resembles the pilchard; but the pilchard, on the other hand, is not so deep a fish as the herring. The sprat and herring differ also in the number of rays in three of the fins out of four which they possess, and also in the tail; the vertebræ in the sprat, too, are forty-eight in number; in the herring they are fifty-six. — *Zoological Journal.*

Why do putrifying fish emit a strong light in a dark room?

Because of the numerous animalculæ, whose growth the putrefaction has promoted.

Why do putrifying bodies emit a fetid smell?

Because their solid and fluid parts are changed into gaseous matter and vapours, while their earthy particles remain.

FRUIT.

Why are some fruits improved in sweetness by drying or half withering on the trees?

Because their watery parts thus exhale, and the sugar is virtually increased in quantity.

Why should grapes hang on the vine until they are perfectly ripe?

Because unripe bunches never get any riper after they are gathered.

Why should grapes be eaten soon after they are gathered?

Because, unlike other fruits, grapes do not improve in flavour after gathering.

Why should the crowns be removed from ripe pineapples?

Because, when suffered to remain, they live upon the fruit till they have sucked out all the goodness.

Why does an apple, when cut, first appear white, and after a time brownish?

Because a fermentation arises from the rest of the fruit absorbing the oxygen of the atmosphere; the apple having previously been, by its tough skin, protected from the contact of the air.—*Donovan.*

Why are certain apples called 'russetings?'

Because of their russet or reddish brown colour.

Why should raspberries be eaten from the bush?

Because their flavour is the most fleeting of all fruit. Even a few hours will diminish it, and on the bush the flavour does not continue above two or three days after the fruit is ripe. If kept for two or three days when gathered, the flavour is almost entirely gone.

Why has the barberry been banished from the hedge-rows of England, where it formerly grew in great abundance?

Because it was generally believed to be injurious to the growth of corn. This belief has been treated as a vulgar prejudice; but the fructification of the barberry is incomplete, unless the stamens be irritated by insects, when the filaments suddenly contract towards the germ. The flowers are therefore, by a beautiful arrangement of nature, peculiarly attractive to insects; and thus the barberry may become injurious to neighbouring plants.

Why are chestnuts best preserved through winter in sand?

Because, if there be any maggots in the chestnuts, they will come out, and work up through the sand to get air.

Why is fern preferable to straw for the bed between the layers of fruit?

Because it does not impart that musty flavour which is so often produced by the straw.

Why are the autumnal fruits, as plums, pears, &c, more crude and indigestible than those of summer?

Because, in part, of the state of the constitution. Thus, at the commencement of summer, the system is more nerved and braced by the atmosphere of winter and spring, and by the drier food which necessity obliges us to take at those seasons; so that the cooling fruits of summer are wholesome from their opening the bowels, &c. But it is not wonderful that a continuance of watery and innutritious food like fruit, should, towards the autumn, produce debility in constitutions partly predisposed to it, by the continual and relaxing heat of the summer months.

VEGETABLES.

Why should juicy vegetables be kept in heaps in damp places?

Because they are then preserved moist; but if spread out, the air soon causes them to shrivel.

Why are the turnip, the radish, and the cabbage, considered very wholesome?

Because of their high antiscorbutic powers, which depend upon a certain acrid volatile oily principle. This is particularly abundant in the seeds of mustard, and the roots of horse-radish; and in less degree in scurvy grass and the roots of the radish. Plants of this order are also believed to possess diuretic and diaphoretic properties; and they are always eatable when their texture is succulent and watery, as in the roots of the radish and turnip, and in the leaves of the cabbage tribe. — *Loudon.*

Why are kitchen vegetables, as peas, French beans, &c, sometimes difficult to boil soft?

Because of the great quantity of gypsum imbibed during their growth, and not on account of the coolness of the season, or rains, as has been generally supposed: to correct this, throw a small quantity of subcarbonate of soda in the saucepan with the vegetables, the carbonic acid of which will seize upon the lime in the gypsum, and thus free the vegetables from its influence.

Why should potatoes and similar roots be stored with the earth adhering to them?

Because they are thus kept damp, whereas by removing the earth, the little fibres by which it is retained are wounded, and the evaporating surface is increased.

Why are potatoes the most nourishing of all vegetables?

Because of the quantity of starch they contain. Salop, tapioca, and sago, chiefly consist of starch, and are proportionally nutritious.

Why are frost-bitten potatoes sweet?

Because of the spontaneous conversion of the starch they contain into sugar.

Why are potatoes unfit for cooking when they begin to spring?

Because their fecula or starch then becomes sweet.

Why are mealy potatoes more nutritious than those which are waxy?

Because of the greater quantity of starch which they contain. Thus, a microscope shows a potatoe to be almost entirely composed of cells, which are sometimes filled, and sometimes contain clusters of beautiful little oval grains. Now, these little grains remain unchanged in cold water, but when it is heated to about the degree that melts wax, they dissolve in it, and the whole becomes a jelly, and occupies a larger space than it did in the form of grains. When a potatoe is boiled, then each of the cells becomes full of jelly, and if there be not a great quantity of starch in the cells, it will not burst. But if the number of grains or their size be very great, the potatoe is broken on all sides by the expansion of the little masses of jelly, and mealiness is produced.

Why do many persons become sleepy after eating lettuce?

Because it contains a milky juice, which, like opium, is a narcotic.

Why should water-cresses be carefully picked in washing?

Because a dangerous plant grows mixed with them in springs and streams, which, when not in flower, much resembles the cresses. Water-cresses, are, however, of a deeper green, and sometimes spotted with brown, the extremities of the leaves are more brown, and especially the last leaves, which are undulated at their edges. The dangerous plant (water parsnip) is of an uniform green, the ends of its leaves are longer and narrower, conical at the extremities, and toothed at the edges. If examined in July, when the flowers are expanded, the two plants may be thoroughly distinguished.

Why do wholesome mushrooms differ from other fungi?

Because, when a fungus is pleasant in flavour, it is wholesome; if, on the contrary, it have an offensive smell, a bitter, astringent, or styptic taste, or is even of unpleasant flavour, it is unfit for food. Colour, figure, and texture cannot be relied on; yet the pure yellow, gold colour, bluish pale, dark or lustre brown, wine red, or the violet, belong to many that are eatable; while the pale or sulphur yellow, bright or blood red, and the greenish, are generally poisonous. The safe kinds have mostly a compact, brittle texture; the flesh is white; they grow more readily in open places than in damp or wood-shaded spots. In general, those may be suspected which grow in caverns, on animal matter putrifying, as well as those whose flesh is watery.— *Brande.*

Why do seeds grow in sand, or on moistened flannel?

Because of the air, warmth, and water which they receive, the use of soil being quite secondary to the growth of seeds generally; although the soil at length becomes the proper means, by which alone the plant can arrive at perfection.

PLANTS IN ROOMS.

Why will not plants flourish in close rooms?

Because they require fresh and constant supplies of oxygen, of which there is but comparatively little in the atmosphere of the room.

Why should not flowers in water, and living plants in pots, be kept in bedrooms?

Because the flowers and plants greatly injure the purity of the air during the night, by giving out large quantities of carbonic acid, similar to that which is separated from the lungs by breathing, which is highly noxious. There are instances of persons who have incautiously gone to sleep in a close room in which there has been a large growing plant, having been found dead in the morning, as effectually suffocated as if there had been a charcoal stove in the room.

Why is not a parlour window an eligible place for bulbous roots in glasses?

Because it is often too warm, brings on the plants too early, and causes them to be weakly. They should, however, be kept moderately warm, and near the light.

SPICES, &C.

Why does black differ from white pepper, although produced from the same plant?

Because the *black* is well garbled and clean, having stalks, bad grains, and other impurities taken out, and, when dry, assumes a dark appearance: divested of its external coat, by steeping the grains in water, and afterwards drying them in the sun, rubbing between the hands, and winnowing, — it is termed *white* pepper.

Why is pepper so important an article of East India trade?

Because in some years above six million pounds' weight of black pepper have been sold at the East India Company's sales, of which seven or eight hundred thousand have been retained for home consumption. — *Miss Kent.*

Why do cloves appear like buds?

Because they are the flowers of a tree before their expansion. The fruit is a very different thing, and quite unknown in commerce.

Why is pimento called allspice?

Because the berries smell and taste like cloves, juniper berries, cinnamon, and pepper, or rather a mixture of them all. The leaves and bark of the allspice tree are full of aromatic inflammable particles, on account of which the growers are extremely cautious not to suffer any fire to be made near the walks, for if it once catch the trees, they consume with great rapidity.

Why is arrow root so called?

Because the Indians use its juice as a remedy for wounds inflicted by poisonous arrows. It is also considered an excellent remedy for the stings of venomous insects.

Why are there different qualities of arrow-root?

Because of the number of washings it has had for bleaching it. .When well washed with good water, it is nearly as white as the potatoe starch; but, by much washing its glutinous quality is diminished, and it is consequently rendered less nutritious. The second quality, which is equally pure, although not so white, affords the strongest jelly, and, therefore, as a food for children, should be preferred.

Why does potatoe flour differ from arrow-root?

Because it is whiter, softer to the touch, and more shining to the sight, than arrow root; and though, with boiling water, it forms a good jelly, in twelve hours it becomes nearly as thin as milk, and is apt to turn sour.

Why are East Indian better than West Indian tamarinds for medicinal purposes?

Because the East Indian tamarinds are preserved without sugar, and contain more acid than any other vegetable substance, in a natural state.

Why should rice be kept in large piles or quantities?

Because the heat will not then allow insects to live in the inside of the heap; consequently, the great wastage takes place at the outside surface. Keeping rice, therefore, for any length of time, either in small piles or in bags, is ruinous.

Why should old pearl and Scotch barley be washed before used?

Because by long keeping it becomes mealy on the surface, and the meal is generally musty and sour.

Why is barley freed from its bran for domestic purposes?

Because the bran contains a resin of a purgative, and even acrimonious nature. Thus, Scotch, French, or pearl barley, is merely common barley, kiln-dried, and deprived of its husks or bran by a mill; the grains are then rounded, and cut down smaller, and lastly, whitened in their own meal.

Why is lemon-juice altered by keeping?

Because the mucilaginous matter which it contains is very soon altered by spontaneous decomposition.

Why are capers wholesome?

Because they are stimulating, antiscorbutic, and aperient. The bark of the root of the common caper passes for a diuretic medicine.

CONFECTIONARY.

Why are fruits preserved by simply putting them in bottles made air-tight?

Because it may lose the narcotic principle which it possesses in its natural state.

Why does the tea differ from the sloe leaf?

Because the tea-leaf, after being infused and dried, will be found narrow in proportion to its length, and deeply notched at the edges, with a sharp point; whilst the sloe leaf is notched very slightly, darker in colour, round at the point, and of coarser texture.

Why is a polished metal tea-pot preferable to one of earthenware?

Because the earthen pot retains the heat only one eighth of the time that a silver or polished metal pot will; consequently, there will be a corresponding difference in their fitness for extracting the virtues of the tea.

Why does a silver, or metal tea-pot, when filled a second time, produce worse tea than the earthenware vessel?

Because the heat retained by the silver, or metal vessel, so far exhausts the herb, when the water is first poured in, as to leave very little soluble substance for a second infusion; whereas, the reduced temperature of the water in the earthenware pot, by extracting only a small portion at first, leaves some soluble matter for a second infusion.

Why is it advisable to pour boiling water into the tea-pot before the tea is 'made'?

Because the vessel being previously warm, may abstract less heat from the mixture, and thus admit a more powerful action.

Why is it recommended to add only a small quantity of boiling water at first?

Because only the water immediately in contact with the herb can act upon it; and it cools very rapidly, especially in earthenware vessels: it is therefore clear that the effect will be stronger where the heat is kept up by additions of boiling water, than where the vessel is filled at once, and the fluid suffered gradually to cool.

Why is a strong infusion of green tea an effectual poison for flies?

Because of the prussic acid it contains.

COFFEE.

Why is coffee so seldom well made in England?

Because, 1st. The berries are over-roasted, their proper colour being that of cinnamon; 2d. The coffee is ground too fine; 3d. Not enough coffee is used; 4th. It is usually overboiled, by which means the bitter principle is extracted from the berries.

Why are we in some measure indebted to the French for our present abundant supply of coffee?

Because all the coffee grown in the West Indies has sprung from two plants taken thither by a French botanist from the botanic garden at Paris. On the voyage the supply of water became nearly exhausted; but so anxious was the Frenchman to preserve the plants, that he deprived himself of his allowance in order to water the coffee plants. Formerly coffee could only be got at a great expense from Mocha in Arabia.

TOBACCO.

Why is the distinction between strong and mild tobacco?

Because of the operation of *topping*, or cutting off the flower to prevent the plant from running to seed. Thus, if *mild* tobacco be wanted, the plant is topped when it has from eighteen to twenty leaves; if it be done when there are fifteen leaves, the tobacco will be of moderate strength; and if there are only eleven or twelve, it will be remarkably *strong*. The Haytian word *tobacco* appears to be the only one that is the same in all the dialects of the old world.

Why is smoking tobacco an agreeable recreation?

Because the smoke, merely drawn into the mouth, without being inhaled into the lungs, acts powerfully on the nervous system, and produces the effects of a narcotic. The chewing of tobacco has a similar influence.

Why are the qualities of tobacco cultivated in England likely to be acrimonious?

Because tobacco is found mild in flavour in proportion to the heat of the climate in which it has grown. Its cultivation here is, however, prohibited by an act of Charles II, otherwise than to the extent of half a pole in a physic garden.

BUTTER, CHEESE, POULTRY, &C.

Why is cream churned into butter?

Because of the heat produced by churning, which thus changes the cream from a fluid to a solid.

Why is a glass tube, called a cream gauge, used in dairies?

Because when filled up to a certain height (ten inches) with new milk of a proper temperature, and then set by for twelve hours, the cream will have risen to the top of the tube, if the cow be a proper one from which to make butter.

Why is lime important in the shells of birds' eggs?

Because the body of the egg contains neither phosphoric acid nor lime, both of which are requisite for the bones of the bird; it was necessary, therefore, that nature should provide means of furnishing both these substances, which it does at the expense of the shell; this becoming thinner and thinner during the whole time of incubation, till the living embryo has appropriated a sufficient quantity for the formation of its bones. Part of the albumen combines with the shell for this purpose, and another portion forms feathers.

Why are Dorking fowls distinguished from others?

Because they have *five* claws; one sort is perfectly white, and another of a partridge colour. These have long been peculiar to Dorking: for Columella, a Roman writer on agriculture, in the first century, describes fowls of this kind, so that it may reasonably be supposed the breed was originally brought here by the Romans. Blumenbach classes fowls with five or six toes among monsters with superfluous parts.

Why do fowls, if kept confined, lay their eggs without shells?

Because they cannot then get at any earth which contains the material requisite for the shell. Dr Paris, (in the *Linnæan Transactions*) shows that if the legs of hens be broken, they will lay their eggs without shells until the fracture is repaired; nature employing all the lime in circulation for the purpose of reuniting the bones.

Why are certain small fowls called 'bantams?'

Because they were first introduced here from Bantam in the Isle of Java, in the year 1683.

Why are eggs preserved by rubbing them with butter?

Because the butter closes the pores in the shell, by which the communication of the embryo with the external air takes place. The embryo is not, however, thus killed. Varnish has a similar effect. Reaumur covered eggs with spirit varnish, and found them capable of producing chickens after two years, when the varnish was carefully removed.

Why is the colouring of cheese unobjectionable, provided it is genuine?

Because the seed, or arnotta, by which the colouring is produced, is slightly purgative and stomachic. It is produced by a bush, or small tree, mostly tropical.

Why is large grained and packing salt best adapted for curing fish, &c.

Because it will remain permanently between the different layers, or will be very gradually dissolved by the fluids that exude from the provisions; thus furnishing a slow but constant supply of saturated brine. For meat-brine the smaller grained varieties answer equally well.

Why is a certain coarse salt called 'bay salt?'

Because it is formed by the evaporation of sea-water in artificial *bays*, or shallow pans on the coast.

CLOTHING.

Why have white veils a tendency to promote sun-burn and freckles?

Because they increase the power of the sun's light.

Why are white hats and dresses worn in summer?

Because dark colours absorb most heat; white, therefore, repels most heat, and is cooler wear. A white dress in winter is good, because it radiates or receives little heat. Polar animals have generally light furs. White horses are both less heated in the sun, and less chilled in winter, than those of darker hues.

Why does a flannel covering keep a man warm in winter, and ice from melting in summer?

Because it both prevents the passage of heat from the man, and to the ice.

Why is it advisable to wrap up the neck, face, &c, from the cold night air?

Because the wrapping, especially if woollen, receives a portion of caloric or heat from the breath, at each expiration, which portion is communicated to the current of air rushing into the lungs at each inspiration.

Why does a person with a cold in the head, or catarrah from the eyes and nose, experience so much more relief on applying to the face a linen or cambric handkerchief than one of cotton?

Because the linen, by *conducting*, readily absorbs the heat and diminishes the inflammation, while the latter, by refusing to give passage to the heat, increases the temperature and the pain. Popular prejudice has held that there was a poison in cotton.—*Arnott.*

Why does the sea air change black hats, clothes, &c, to a rusty brown?

Because of the iron contained in the dye. Most, if not all, of the usual black colours, have iron for a basis, with galls, logwood, or other substances containing gallic acid. Now the sea-air contains a proportion of the muriates over which it is wafted; and these coming into contact with anything dyed black, part with their muriatic acid, and form the brown or red oxide, called rust. The gallic acid, indeed, from its superior affinity, has the strongest hold on the iron; but the incessant action of the sea air, loaded with muriates, partially overcomes this, in the same way as any acid, even of inferior affinity to the gallic, when put upon black stuff, will turn it brown.

Why is loose clothing warmer than such as fits close?

Because the quantity of imperfectly conducting air thus confined around the body, resists the escape of animal heat.

Why is cotton warmer than any other fibrous threads?

Because the fibres of cotton, when examined by the microscope, will be seen to be finely toothed: this explains the cause of their adhering together with greater facility than the fibres of other species which are destitute of teeth, and which cannot be spun into thread without an admixture of cotton.

Why does oiled silk, or other air-tight covering, laid on a bed, preserve greater warmth than an additional blanket or more?

Because the oiled silk prevents the ventilation of the person by the slow passage of air, as through the texture of the blanket.

Why does worsted differ from yarn?

Because separate threads of wool are more twisted for the worsted, of which stockings and stuffs are made, than for the yarn, of which blankets, carpets, &c, are made. Worsted was named from its being originally manufactured in great quantities, at Worsted in Norfolk, once a large town, but now reduced to a village; the manufacture being removed to Norwich and its vicinity.

Why is linen disadvantageous for wear next the skin?

Because it retains the matter of perspiration in its texture, and speedily becomes imbued with it; it gives an unpleasant sensation of cold, is very rapidly saturated with moisture, and conducts heat too rapidly.

Why is woollen cloth advantageous?

Because of the readiness with which it allows the perspiration to escape through its texture, its power of preserving warmth to the skin under all circumstances, the difficulty of making it wet through, the slowness with which it conducts heat, and the softness, lightness, and pliancy of its texture.

Why are blankets so called?

Because they were first made in 1340, by one Thomas Blanket, and some other inhabitants of Bristol.

CLEANING.

Why are alkalies employed in making soap?

Because an alkali is the only article capable of enabling tallow or oil to combine with water, and to give soap its detergent quality. The tallow moderates the alkali, and prevents its injuring the hands of those who use it. The ancient Gauls and Germans were probably the inventors of soap, as we are told by Pliny that they made soap with the ashes of vegetables and tallow. A soap-boiler's shop, with soap in it, was discovered in the city of Pompeii, overwhelmed by Vesuvius, A.D. 79.

Why is alkali used in bleaching?

Because it loosens and carries off that particular substance in the cloth which occasions its brown colour, and which Dr Home says is a kind of heavy oil.

Why are muslins and cottons thrown into pump water after being washed in soft?

Because of the astringent properties of the hard water, which gives the fibres a peculiar firmness, whilst the soft water would leave them lax.

Why is potash so called?

Because it was formerly procured by burning vegetables in large iron *pots.* Potash is now prepared in large quantities in wine-countries, by the incineration of wine lees and must.

Why is soda so called?

Because it is procured by burning the plant *salsola soda,* which grows on the Spanish coast.

Why do the properties of soda and potash differ in soap-making?

Because, with soda, oil forms a hard soap; with potash a soft one.

Why do pearl-ash and water remove grease spots?

Because the pearl-ash unites chemically with the grease, forming a species of soap, which easily washes out.

Why is pipe-clay used for scouring cloth?

Because pure clay, or alumina, has great affinity for greasy substances.

Why does fullers' earth remove grease spots?

Because of the alumina which it contains.

Why is alum used in dyeing?

Because it cleanses and opens the pores on the surface of the substance to be dyed, rendering it fit for receiving the colouring particles, (by which the alum is generally decomposed) and at the same time making the colour fixed.

Why do combs stained to imitate tortoiseshell, soon become dull?

Because of the lead used in the dye resuming its usual metallic appearance.

Why, in cementing, should bodies be heated before, and closely pressed together, after the cement is applied?

Because very little of the cement may be left between the pieces, as the thinner the cement is spread, the firmer it will hold.

Why should plated articles be kept dry?

Because the coating of silver on them is so thin as not to prevent their speedily becoming cankered or rusted by damp.

Why is quicksilver a dangerous ingredient of plate-powder?

Because, although it gives a speedy polish, the silver cleaned with powder in which it is contained, soon tarnishes, and becomes so brittle as to break when let fall. Golden articles are also much injured from contact with quicksilver and mercurial preparations. Gold rings have been known to burst on the fingers using mercury or handling quicksilver. A genuine sovereign, dipped in quicksilver, partly silvered over, and afterwards rubbed with aqua-fortis, has been snapped asunder like a piece of rotten stick.

THE DRESSING-ROOM.

Why is charcoal the best dentrifice?

Because of its antiseptic properties and its destroying the smell of various substances; thus rendering it a ready sweetener of the breath.

Why does tartar on the teeth destroy them?

Because it consists of animalculæ, which produce decay and tooth-ache. Crab verjuice, diluted with water, will destroy them.

Why may genuine carmine be safely used?

Because it is made from cochineal.

Why is spurious carmine usually heavier than genuine?

Because it is adulterated with vermillion or red lead.

Why are depillatories useless to destroy superfluous hairs?

Because they only destroy the trunks of the hair; the roots being left, the hairs will, of course, grow.

Why does a hair drawn between the finger and thumb from the end to the root, give greater resistance, and a different sensation, to that caused by drawing the hair contrarywise?

Because the hair is indented with teeth, resembling a coarse round rasp, but extremely irregular and rugged; and these incline all in one direction, like those of a common file, from the origin of the hair towards its extremity.

Why do onions rubbed on the scalp stimulate the growth of hair?

Because of the ammonia contained in the onion. Hartshorn diluted is used by some persons for dressing the hair.

Why are camphor, pepper, musk, &c, useless to rid a wardrobe of clothes-moths?

Because neither of these articles will affect the eggs of clothes-moths, and even the insects sometimes wrap themselves up too closely to be affected by any thing but *heat*. This, when it can be conveniently applied, will be certain either to dislodge or to kill them. The keeper of the Museum at Strasburg, to convince himself of the uselessness of camphor, hatched moths in the strong smell of camphor.

Why are cedar and rose-wood unattacked by insects?

Because of the aromatic oils they contain; all volatile or odorous substances being particularly destructive to the minute insects and animalculæ found in wood.

CULINARY IMPLEMENTS, &C.

Why is 'Prince's metal' so called?

Because it was invented by Prince Rupert, an ingenious philosopher of the time of Charles II. It is made by alloying copper or brass with zinc, and it approaches nearest to the colour of gold. The finest sort is called pinchbeck, and is sometimes used in making watch-cases, &c. The toys known as 'Rupert's Drops' are also of his invention.

Why are some tea-trays, snuff-boxes, &c, called 'papier-maché?'

Because they are made of cuttings of white or brown paper, boiled in water, and beaten in a mortar till they are reduced to a kind of paste, and then boiled with a solution of gum arabic, or of size, to give consistency to the paste, which is afterwards formed into different shapes, by pressing it into oiled moulds. When dry, it is coated with a mixture of size and lamp-black, and afterwards varnished. In Paris, a very economical mode of procuring the materials for *papier-maché* is now adopted:—the walls being diligently stripped of the posting-bills, which thus afford both paper and paste for the moulding of snuff-boxes, &c.

Why does a silver spoon change colour when immersed in an egg?

Because the egg contains sulphur, or sulphureted hydrogen, that is to say, one part of hydrogen combined with sixteen parts of sulphur.

Why do house-bells often fail to ring when pulled in summer?

Because the wires then become expanded or slack, whereas they are of proper length in winter.

Why is black-lead used for the fronts of grates, &c?

Because it preserves them from rust, besides improving their appearance; and its polish is not affected by heat.

Why may copper saucepans be safely used in cooking, if kept clean?

Because fat and oily substances, and vegetable acids, do not attack copper while *hot*. If soup, gravy, &c, grow *cold* in copper vessels, danger will ensue. If put away damp, they become crusted with poisonous matter, and if not often used their surface becomes rusted by exposure to the atmosphere. At Paris, in August, 1829, a gentleman was poisoned by partaking of soup which had been warmed in a saucepan thus infected.

Why is pewter of superior sweetness for domestic purposes?

Because of the great proportion of tin which it contains. Thus, the mixture for pewter is 112lbs tin, 15lbs lead, and 6lbs brass; and some manufacturers make it of bismuth and antimony. Bismuth is generally mixed with tin, to give that metal more brilliancy and hardness.

Why is common yellow earthenware called 'delft?'

Because it was originally manufactured at the town of Delft, in Holland.

LAMPS AND CANDLES.

Why does the flame of a candle burn in a conical shape?

Because the flame is a tube or cone of fire, the hollow part of which is filled with the vapour which is not inflamed, and the vapour being gradually consumed as it rises, the quantity is lessened in its dimensions. The vapour is rendered of less specific gravity than the air, and so is the flame, or ignited vapour; consequently it rises upwards.

Why do Argand's or 'patent' lamps give an improved light?

Because any contrivance by which air may be more freely admitted to a body in a state of combustion, makes it go on more actively, and thus lamps receive the air into a hollow within the flame, by which means oxygen enters into it externally and internally. Lord Cochrane's lamps, by exposing a larger surface to admit oxygen, were an improvement upon the common lamps in the streets.

Why is the supply of oil in an Argand lamp placed above the flame, and with its mouth downwards?

Because the mouth being immersed in oil, of which the surface is nearly on a level with the flame, no oil can escape from above but as the flame consumes the free oil, which is its supply, and which is thus maintained at a constant elevation. — *Arnott.*

Why do some lamps burn without a wick?

Because the oil is raised through a small tin tube, which becoming hot, the oil is decomposed, and gas generated. When this is consumed, a new portion comes up to supply its place, and this continues as long as any oil remains in the cup.

Why does the wick of a lamp smoke but little when surrounded by a glass?

Because the principles of the oil, that supply the flame, are concentrated within the tube of glass, and are thus more effectually consumed than in the open air. Hence, also, the light is improved.

Why does a lamp smoke when the wick is cut unevenly?

Because the gas or vapour of the oil escapes more at the longer part of the wick, and not reaching the centre of the flame, cannot be entirely consumed.

Why do we sometimes see the street oil-lamps, after a foggy night, burning to a late hour next morning?

Because one effect of a fog is to diminish the combustion of oil in lamps and other lights; which shows that misty and damp air does not furnish oxygen so readily as that which is clear.

Why are white wax tapers safer than green for ordinary use?

Because green tapers are coloured with verdigris, and when burnt, the copper of the verdigris is reduced for a time in the wick. If such a taper be lighted, and the flame then blown out, leaving the wick glowing, combustion of the wax will still proceed, slowly indeed, but for hours and days together, until the whole of the wax is burnt, or until the combustion has reached some part where it is extinguished by the contact of neighbouring bodies. This does not happen with white tapers, and hence they are safer.

LIGHT AND SHADOW.

Why does a person viewing himself in a looking-glass, appear on the glass but one half his real magnitude, let his distance from the glass be in any manner varied?

Because his image appears behind the glass, exactly at the same distance as the object is before it, the mirror being half way between him and his apparent image, and cutting in half the cone of rays proceeding from his image to the eye. — *Arnott.*

Why have cats and other domestic animals their passions strongly excited, when viewing themselves in a looking-glass for the first time?

Because common experience leads them to expect the object to be in the direction in which the rays come to their eyes, instead of in the real place of the object.

Why does a gold fish in a glass globe often appear as two fishes?

Because the fish is seen as well by light bent through the upper surface of the water, as by straight rays passing through the side of the glass.

Why is the shadow of a hand held between a candle and the wall, gigantic?

Because the light-giving surface is then smaller than the opaque body, and the shadow is consequently larger than the body.

Why are bay, or large windows, preferable to a row of smaller windows in rooms?

Because the bays admit the light in masses, which thus sets off all forms to advantage.

Why do we wind up watches?

Because one turn of the axle on which the watch key is fixed, is rendered equivalent, by the train of wheels, to about four hundred turns or beats of the balance-wheel; and thus the exertion, during a few seconds, of the hand which winds up, gives motion for twenty-four or thirty hours. — *Arnott.*

Before a watch is ready for the pocket, the component parts must have passed through the hands of not less than one hundred and fifty different workmen.

Why do some time-pieces go for a year?

Because the number of wheels is proportionally increased; if the material would last, they might easily be made to go for a hundred or a thousand years. — *Arnott.*

LOCKS.

Why are locks known to be of high antiquity?

Because sculptures of locks similar to those now used in Egypt, have been discovered on the great temple of Karnac, whence Denon infers locks were known in Egypt about four thousand years since. A lock resembling the Egyptian is used in Cornwall, and the same has been seen in the Faro islands; to both which places it was probably taken by the Phœnicians.

Why are Bramah's locks more secure than others?

Because of their combinations, or multiplication of numbers into each other, which is known to increase in the most rapid proportion. Thus, a lock of five slides admits of 3,000 variations, while one of eight will have no less than 1,935,360 changes; or, in other words, that number of attempts at making a key, or at picking it, may be made, before it can be opened. This difficulty, great as it is, has been increased a hundred fold by an improvement of the inventor's son.

KNOWLEDGE FOR THE PEOPLE:

OR THE

PLAIN WHY AND BECAUSE.

PART II. — ZOOLOGY. — QUADRUPEDS.

ZOOLOGY.

QUADRUPEDS.

THE GENERAL SUBJECT.

Why are certain animals called Mammalia or Mammifera?

Because they have breasts (*mammæ*) with which the females suckle their young.

Why is the class of mammifera placed at the head of the animal kingdom?

Because, not only that we ourselves belong to it, but it is that class which possesses the most numerous faculties, the most delicate sensations, and the greatest variety of action; and in which the assemblage of all these qualities appears so combined, as to produce an intelligence more perfect, more fertile in resources, less the slave of instinct, and more capable of progressive perfection, than what is found in any of the other classes.

Why are mammalia and birds called warm-blooded?

Because their blood is of heat about 100°, more or less.

Why are other animals called viviparous?

Because they produce their young alive and perfect, (from *vivus* and *pario)* as man, quadrupeds, &c.

Why are certain animals called vertebrated?

Because they have a cranium, or bony cavity, containing the brain, and a succession of bones called the spine, and the divisions of it *vertebræ*, proceeding from the cranium, and containing a prolongation of the brain, denominated the spinal marrow.

Why are other animals called invertebrated?

Because they have no vertebræ.

Why does the faculty of instinct differ from intelligence?

Because instinct makes animals perform certain actions, necessary to the preservation of the species, but often altogether foreign to the apparent wants of the individual; and often, also, extremely complicated. We cannot attribute these actions to intelligence, without supposing a degree of foresight and understanding infinitely superior to what we can admit in the species that perform them. The actions performed by instinct are not the effects of imitation, for the individuals that execute them, have often never seen them done by others; they bear no proportion to the common intelligence of the species, but become more singular, more skilful, more disinterested, in proportion as the animals belong to the less elevated classes, and are, in other respects, most stupid. They are so much the property of the species, that all the individuals perform them in the same manner, without any improvement.

The working bees have, since the beginning of the world, constructed the most ingenious edifices, agreeable to principles of the highest geometry, and destined to lodge and nourish a posterity which is not even their own. Solitary bees and wasps form also very complicated nests for their eggs. From the egg there springs out a worm, which has never seen its mother, which does not know the structure of the prison in which it is enclosed; but, when once it is changed into a wasp or bee, it constructs a similar nest, equally perfect, for its own egg.

BONES.

Why is fossil osteology, or the knowledge of bones dug out of the earth, an important branch of anatomy?

Because it not only brings to our knowledge races of animals, very different from those with which we are acquainted, but supplies many intermediate links, in the gradation of structure, which are wanting in the present creation; and, therefore, makes it probable that, when the two are sufficiently investigated, one regular, connected chain will be formed, each class of animals imperceptibly running into that which is next to it. — *Sir E. Home.*

Why are bones excellent manure?

Because of the large proportion of lime which they contain.

Why are teeth important in identifying different animals?

Because, by the largeness of the tooth, the naturalist can judge of the relative size of the animal which bore it; and by the form of the tooth he can tell whether it was fitted to grind grass, or to tear flesh; and therefore, whether it belonged to an herbivorous or a carnivorous species. Pursuing his enquiries from this point, he could decide in a great degree, as to the structure of the stomach and viscera; the extremities, whether armed with claws or protected with hoofs; and, farther, he can judge of the vivacity of the senses which belonged to the animal, and of the habits which it derived from its peculiar conformation:—knowing, beyond all doubt, that there was an intimate agreement in all the properties of its existence, and that every thing in its organization was regulated by an undeviating harmony. — *Lib. Ent. Knowledge.*

Why are the lives of wild animals shortened by the loss of teeth?

Because, as old age increases, the teeth fall out, and the means of obtaining food thus failing, the body sinks to rest. Man is the only animal that can counteract the fatal consequences of the loss of teeth.

Why are the incisor or front teeth of gnawing animals always sharp?

Because, as the teeth are covered by enamel only on their anterior or convex surface, and the bone wears down much faster than this harder covering, the end of the tooth is a sharp cutting edge. No animal exhibits their structure better than the rat.

Why do carnivorous animals masticate their food very imperfectly?

Because their lower jaw can only move upwards and downwards, and is incapable of that horizontal motion which constitutes genuine mastication.

Why do other animals which live on vegetables, masticate their food thoroughly?

Because they can move the lower jaw backwards and forwards, and to either side, so as to produce a grinding effect, necessary to bruise grass and to pulverize grain. The teeth may be compared, in the carnivorous animals, to scissors: in the other animals, to the stones of a mill. — *Blumenbach.*

Why do carnivorous animals prey on those which derive their food from the vegetable kingdom?

Because the food of all animals either mediately or directly, is derived from vegetables.

Why are the teeth of some animals, as the cow and sheep, darker in the centre than elsewhere?

Because the cement which should fill up the teeth, is sometimes not completely deposited before the tooth cuts the gum: hence, cavities are left in the centre of the tooth, which become filled with a dark substance, composed of the animal's food, &c. — *Blumenbach.*

Why are bullets sometimes found imbedded and concealed in ivory tusks?

Because they have been lodged there by the muskets of hunters; and, as the tusks are continually growing during the animal's life, the bullet becomes surrounded by new layers of ivory, while no opening exists between it and the surface, to account for its entrance. — *Philos. Trans.*

Why does the dog, while changing his teeth, appear to have the canine teeth doubled?

Because the permanent ones cut the gum before the old ones have fallen out.

THE STOMACH.

Why are certain animals called ruminating?

Because they first imperfectly chew and swallow their food, and subsequently return it through the œsophagus or gullet, in small quantities at a time, to the mouth, there to be thoroughly masticated, and then swallowed a second time.

Why do certain animals ruminate?

Because, it is supposed, of a voluntary power in the œsophagus; and, indeed, the influence of will throughout the whole process, is incontestible. It is not confined to any particular time, since the animal can delay it, when the paunch is quite full. Blumenbach knew four men who ruminated their vegetable food, and assured him they really enjoyed the process; and two of them had the power of doing, or abstaining from it at pleasure. The final purpose of rumination, is, however, unexplained. — *Blumenbach.*

Why do some animals, as the dog, vomit very easily, while others, as the horse, scarcely can vomit?

Because of a peculiarity in the opening of the œsophagus or gullet, into the stomach, both in size and mode of termination. — *Blumenbach.*

Why are hair balls found in the stomachs of some animals?

Because the animal has licked off its own hair, which thus gradually accumulated in the stomach.

Why is this hair found in balls?

Because the motion of the paunch in which it is found is rotatory.

CLOTHING.

Why does the fur, wool, or feathers, of quadrupeds and birds, vary in quantity and quality, in different regions?

Because, generally, of the temperature of the region which the animal inhabits. Thus, the dogs of Guinea, the Indian sheep, and the African ostrich, are so thinly clothed, that they may be considered almost naked. The temperature of their bodies is thus necessarily diminished in proportion to the heat of the climate in which they live. The Iceland sheep and the Esquimaux dog, on the contrary, are covered with a warm coat both of hair and wool, which enables them to bear the most intense cold, without much inconvenience.

Why are the skins of hairs and rabbits seldom ripe in the fur till frosty weather has set in?

Because the growth of the hair is dependent upon the temperature of the atmosphere: previous to winter, the hair of all animals is increased in quantity and length, and the more they are exposed, the greater is the increase.

SECRETIONS.

Why have certain animals glands and bags secreting offensive substances?

Because they may pour out the fetid matter when pursued; and thereby effectually defend themselves, as neither man nor animal can then approach them. This explains the smell of the polecat, the skunk, &c.

Why is the gall-bladder thought to belong particularly to carnivorous animals?

Because it is connected with their habit of long fasting, and serves as a reservoir for the bile. — *Cuvier.*

RESPIRATION.

Why do animals respire?

Because their blood, white or red, hot or cold, must, in a state of health, be constantly supplied, either from the atmospheric air, or from water, with successive quantities of a substance necessary for the continuance of life (oxygen); giving off, in return, equal quantities of another, (carbon.) This remarkable process is principally effected by respiration, which red-blooded animals perform either by lungs, or, like fishes, by means of gills; and white-blooded, by analogous organs.

Why is respiration the principal cause of animal heat?

Because the air in breathing loses its oxygen, and is replaced by an equal quantity of carbonic acid gas, which is ejected from the lungs at a temperature of about 90°.

Why does the respiration of animals vary?

Because of the relative proportion of blood presented to the respiratory organs in a given time, and of the relative proportion of oxygen which enters into the composition of the fluid in which the animal lives, whether air or water.

In mammiferous quadrupeds the quantity of respiration is less than that of birds; but it is greater than that of reptiles, on account of the structure of the respiratory organs; and exceeds that of fishes, on account of the different elements in which they live. Hence result the four kinds of movements, which the four classes of vertebrated animals are particularly destined to exert. — Mammiferous animals, in which the quantity of respiration is moderate, are generally formed to develope their strength in walking or running. Birds, which have a larger quantity of respiration, have the activity and strength of muscles necessary for flying. Reptiles, in which respiration is more feeble, are condemned to crawl; and many of them pass a part of their lives in a kind of torpor. Fishes require to be supported in an element nearly as heavy as themselves, in order to exert their proper motions in swimming.

Why are digestion, circulation, and respiration called organs of involuntary motion?

Because they go on continually, without intermission from exhaustion, like the voluntary, which require repose and sleep to recruit themselves.

Why do otters remain under water for some time?

Because of certain vessels which serve to receive part of the returning blood, and to retain it until respiration can be again performed, and the lesser circulation be thereby again put in motion. — ***Blumenbach.***

FEELING.

Why is the feeling the most general of the external senses?

Because it resides in the membrane that covers the whole body, called the skin.

THE EYE.

Why do certain animals see in the dark?

Because their eyes are usually of a large size, to admit a greater number of rays, and that part which is called the *choroides*, reflects, instead of absorbs, the light.

Why is a certain variety of the rat and the mole blind?

Because in both these animals, a hairy curtain, in which there is no fissure, is continued over the shrivelled eyes.

Why may the blind rat be said to have eyes, although it does not see?

Because nature has bestowed on this and similar animals, a kind of rudiment of eyes, which have not the power of perceiving light; as if in compliance with some general model for the bodily structure of such animals.—*Blumenbach.*

Why have Albinoes, white hair, or feathers, and peculiar eyes.*

Because of a defect in the colouring matter of the coverings of the skin, which is always connected with a defect in sight, arising from the deficiency in the eye of what is called the mucous pigment. Blumenbach thinks that this deficiency is hereditary in some of the mammalia, so as to form a constant breed of white animals, as in the rabbit, mouse, and horse; and that, in the same way, the ferret, whose white skin and red glassy eyes are well known, is descended from the polecat.

Why have spotted dogs, rabbits, &c, a mixture of colours in the iris of the eye?

Because the variations of the iris are connected with the colour of the hair.

Why is the muscle of the eye-ball in certain carnivorous and cetaceous animals called the retractor of the eye?

Because it enables the animals which possess it to draw the globe back into the orbit.

THE MUSCLES.

Why is the heel of the badger covered with long hair?

Because the heel itself cannot rest on the ground; although the structure both of the bones and muscles of the lower extremity of this animal approaches considerably to that of man.—*Notes to Blumenbach.*

Why do the squirrel, opossum, &c, grasp objects by their two fore-paws?

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* Among Albinoes are not only quadrupeds and birds, but the human race.

Because they want a separate thumb to act in opposition to their fingers, which are sufficiently long and moveable.

Why are carnivorous animals unable to grasp any object?

Because that toe which is in the situation of a thumb is parallel with the other toes.

Why is Five said to be the most favourite number of Nature?

Because at least the half of all known plants have the parts of fructification in *fives*, or in a number which is the product of *five*. The radiated divisions of animals are likewise in *fives* — as the sea-stars, medusæ, madrepores, &c. Throughout Cuvier's whole vertebral division, *five* is the leading number. For example, we have *five* fingers to the hand, and *five* toes to the foot, in common with most of the mammalia. We have *five* principles, constituting the higher order of vertebral animals, Man — viz, I, inert matter; II, the attractive principle; III, the living principle; IV, the sentient principle; V, the intellectual principle. — Our *five* senses — seeing, hearing, smelling, tasting, feeling, need not be added, for no one has overlooked this fact. — *Professor Silliman.*

Why do animals and plants return to their native earth?

Because, after death, their bodies are gradually destroyed by fermentation, putrefaction, and the chemical affinities of their elements, and thus internal organization is destroyed.

Why are apes called four-handed animals?

Because, instead of having a great toe parallel with the others, they are furnished with a real thumb, that is, a part capable of being opposed to the other toes.

Why do apes live in trees?

Because their four hands enable them to climb with the greatest facility.

Why are the hands of apes much less useful than the human hand?

Because the thumb is small, short, and weak, and the other fingers long and slender; and the great superiority of the human hand arises from the size and strength of the thumb.

Why does the ourang-outang walk but imperfectly in an erect position?

Because parts of his toes are remarkably curved in their shape; whence he holds the branches of trees more firmly.

Why have many species of the ape-tribe cheek-pouches?

Because they may place small reserves of food in them, while living in trees.

THE BAT.

Why are bats supposed to perceive external objects, without coming actually in contact with them?

Because in their rapid and irregular flight amidst various surrounding bodies, they never fly against them; yet it does not seem that the senses of hearing, seeing, or smelling, serve them on these occasions, for they avoid any obstacles with equal certainty when the eye, ear, and nose are closed: hence naturalists ascribe a *sixth sense* to these animals. It is probably analogous to that of touch. The nerves of the wing are large and numerous, and distributed in a minute plexus (network) between the integuments. The impulse of the air against this part, may possibly be so modified by the objects near which the animal passes, as to indicate their situation and nature.—*Notes to Blumenbach.*

Why does the bat tribe fly?

Because the fingers of the fore-feet, the thumb excepted, are in these animals longer than the whole body, and between them is stretched a thin membrane or web, for flying. Hence they are as little capable of walking on the ground as apes with their hands, or sloths with their hooked claws, which are calculated for climbing.

Why is a certain species of bat called a Vampyre?

Because it sucks the blood of larger mammifera than itself, as well as of men when asleep, in whom it commonly attacks the toes.—*Blumenbach.*

SQUIRRELS.

Why is a certain species of squirrel said to fly?

Because it has a loose membrane extended laterally between the fore and hind feet, which serves the purpose of a parachute, and enables the animal to spring from great heights.—*Blumenbach.*

Why do the flight-like leaps of some squirrels differ from flying?

Because the provisions for the purposes of wings rather support the animal in its long and desperate leaps, than raise it in the air, and direct it towards any given object. The want of proper muscles, also, in a great measure incapacitates them from performing such offices as are dependent on volition, or will.

Why does this species of squirrel always fly from the upper parts of trees?

Because it cannot rise in its flight, so that, in proportion to the distance the tree it designs to fly to is from them, so much the higher they mount the tree they fly from, that they may reach some part of the tree, even the lowest, rather than fall to the ground.

THE DORMOUSE.

Why does the fat dormouse remain in a torpid state throughout the winter?

Because this creature possesses so little heat, that it scarcely exceeds the ordinary temperature of the air: its torpor ceases with the cold; a few degrees of heat, about 10 or 11, will reanimate it, and if kept during winter in a warm room, it continues action, like other animals,the whole season. When the cold approaches, it rolls itself into a ball, and in this state may be found in winter in hollow trees, clefts of rocks, or in holes in walls exposed to the south; it may be taken and rolled about without being roused—nothing, indeed, seems to awaken it from its lethargy but gradual heat. If exposed suddenly before a fire, it dies; resuscitation can only be effected by degrees. In this state, however, although deprived of the capability of movement, with the eye closed, and in an apparent state of death-like indifference, it possesses a feeling of pain, when sharply inflicted; a wound or a burn causes it to contract, and to make a slight sort of convulsive leap, which it will repeat several times.

THE MARMOT.

Why have marmots been called 'haymakers?'

Because they bite off grass, turn it, and dry it in the sun. It is said they use an old female marmot as a cart: she lies on her back, the hay is heaped on her belly, and two others drag her home.—*Med. Gazette.*

THE LEMMING.

Why were lemmings formerly said to fall from the heavens?

Because whole legions sometimes emigrate from one place to another, and their unexpected and unnoticed arrival, together with the accidental fall of those which might have escaped from the claws of birds, by which they had been taken up into the air—probably gave rise to this superstition.

Lemmings emigrate in such numbers, that the country is literally covered with them; marching always in a straight direction, and never suffering any obstacle to impede them. On reaching a river, the foremost advance, and swimming across, form a kind of floating bridge, the head of each supported by the hinder part of that before it. The remainder of the lemmings then pass rapidly over the backs of the supporters, and thus gain the opposite shore.—*De Capell Brooke.*

PORCUPINES.

Why does the porcupine rattle its prickles?

Because it is enraged: it has not, however, the power of shooting them at its pursuers.—*Blumenbach.*

Why are porcupines erroneously supposed to dart their quills to a distance?

Because it is probable, that being loosely attached to the animal, they are occasionally broken off, and remain fixed in substances into which they have been thrust.

Why are the spines or quills of the Canada porcupine fatal to its assailants?

Because the quills are rough with minute teeth, directed backwards, that render this seemingly weak and flexible weapon a very dangerous one. Their points, which are pretty sharp, have no sooner insinuated themselves into the skin of an assailant, than they gradually bury themselves, and travel onwards until they cause death, by wounding some vital organ

THE HEDGEHOG.

Why does the hedgehog stick its prickles into fruits?

Because it may bring them to its holes, a fact which has been asserted by the ancients, and denied by the moderns; but of which, observes Blumenbach, 'I have been assured by three credible witnesses.'

THE WATER-SHREW.

Why has the water-shrew small stiff hairs on the toes?

Because they render the foot excellently adapted for rowing, and serve instead of a swimming membrane. The minute shrew is the smallest mammiferous animal yet known: it weighs but half a drachm.—*Blumenbach.*

THE OPOSSUM.

Why does the female opossum carry her young in a pouch on the belly?

Because the teats are placed at the bottom of this pouch. The young ones are born small beyond all proportion, like imperfect abortions. Being carried in this pouch, and nourished by the mother's milk, until mature, and more perfectly formed, they are, as it were, born for the second time. — *Blumenbach.*

THE SKUNK.

Why is the skunk so called?

Because of the insupportable stink, which it, like several other species of this genus, emits when enraged. — *Blumenbach.*

THE ICHNEUMON.

Why is the ichneumon so serviceable in Egypt?

Because it destroys the eggs of the crocodile, and also serpents.

THE WEASEL.

Why was it said that the weasel produced her young in the mouth?

Because the mother often carries the young ones in her mouth. — *Blumenbach.*

THE PINE-MARTEN.

Why is the pine-marten valued for its skin?

Because its beautiful fur comes nearest to that of the sable.

BEARS.

Why has the polar bear a firm footing on the ice?

Because the soles of his feet are almost entirely clothed with long hair.

Why are polar bears sometimes met with in the winter months?

Because, not having accumulated sufficient fat for their winter sustenance, they are compelled to shift for themselves during the usual period of torpor.

Why does the male polar bear retire to his winter-quarters with less regularity than the female?

Because in the females this retreat is essential to the preservation and security of their offspring.

Why are the female bears more ferocious on emerging from their winter-quarters than at any other season?

Because of their extreme leanness, and the cravings of their own appetites, combined with the necessity of providing for their young.

Why is it said that no man, either Christian or Indian, ever killed an American she-bear with young?

Because the pregnant females always conceal themselves.—'After numerous enquiries among the Indians of Hudson's Bay,' says Dr Richardson, 'only one was found who had killed a pregnant bear.'

Why is the flesh of some bears tainted and unfit for use?

Because they have fed much upon fish; otherwise they are reckoned very good eating. Their tongues and paws are considered the most delicate parts, and the hams made from them are said to be not inferior to those of Westphalia.

Why do bears live through the winter without food?

Because they absorb the fat accumulated in the course of the summer, from the setting in of the cold season until the return of spring.

Why does the honey bear attack bees with impunity?

Because it has a shaggy fur, with an uncommonly thick and lax skin, by which it is defended alike from the stings of bees and the teeth of dogs.

Why are bears said to hug their enemies?

Because, when irritated, they usually raise themselves upon their hind feet, and endeavour to engage and squeeze their opponent between their fore-legs, which are excessively powerful.

DOGS.

Why is the dog less carnivorous than the cat-tribe?

Because the cheek teeth are less adapted for tearing flesh, and the tongue is smooth.

Why do the dog and the elephant approach nearer than any other quadrupeds to the perfection of man?

Because of the following peculiarities: the dog is the only animal that dreams; and he and the elephant the only animals that understand looks; the elephant is the only animal that, besides man, feels *ennui*; the dog, the only quadruped that has been brought to speak. Leibnitz bears witness to a hound, in Saxony, that could speak distincfly thirty words.

Why does the domestic dog differ from other varieties?

Because it has the tail curved upwards. Whenever there is white on any part of its tail, the *tip* is invariably white.

Why is the dog so attached to man, while almost every other quadruped fears man as its most formidable enemy?

Because this particular species of animal feels a natural desire to be useful to man, and, from spontaneous impulse, attaches itself to him. Were it because we train the dog to our use, and have made choice of him in preference to other animals, we should see, in various countries, an equal familiarity with various other quadrupeds; but everywhere the dog only takes delight in associating with us, and is even jealous that our attention should be bestowed on him alone; it is he who knows us personally, watches for us, and warns us of danger. — *Cuvier.*

Why is the dog the most complete, the most remarkable, and the most useful conquest ever made by man?

Because every species has become our property each individual is altogether devoted to his master, assumes his manners, knows and defends his goods, and remains attached to him until death; and this proceeds neither from want nor restraint, but solely from true gratitude and real friendship. The swiftness, the strength, and the scent of the dog, have created for man a powerful ally against other animals, and were perhaps necessary to the establishment of society. He is the only animal which has followed man through every region of the earth.—*Cuvier.*

Why are dogs considered by some naturalists to be domesticated wolves?

Because the anatomy of both, for the most part, corresponds: the wolf is, however, larger and more muscular. Their period of gestation is the same, although differently stated by Goldsmith; which statement led to an inference, that the dog and the wolf were essentially a different species.

Why do dogs bark at beggars?

Because the rags and misery of the poor mendicant induce the imagination of the dog to see in him a robber of his master's house, or one who will be cruel to himself—and he expresses his own fears by a bark.

Why is a house-dog terrified at a naked man?

Because the latter is to the dog an unaccustomed sight.

Why are dogs enabled to bear hunger for a very long time without any serious injury?

Because they have a supply of some substance for the distension of their stomachs; hunger being the effect of the stomach's contraction. Dogs have been known to live for forty days without food, or substitute for food.

Why is the Mackenzie-river dog so valuable to the Indians in the chase?

Because its want of courage and strength to pull down large animals, is more than compensated by its broad foot and light make, which enable it to run over the snow without sinking, if the slightest crust is formed on it, and, thus, easily to overtake and tear the moose or rein-deer, and keep them at bay till the hunters come up. — *Dr Richardson.*

Why is the hare-Indian dog peculiar to the banks of the Mackenzie River?

Because, being only fitted for the chase, it has, since the introduction of guns, gradually given way to the mongrel race, sprung from the Esquimaux, Newfoundland, and this very breed, with occasional intermixture of European kinds. Formerly, perhaps, it was generally spread over the Northern parts of America. — *Dr Richardson.*

Why do Newfoundland dogs swim better than others?

Because they are semi-webbed between the toes; which mechanism of the foot presents an extended surface, to press away the water from behind, and then collapses, when it is drawn forward, previous to making the stroke. Sir Everard Home describes this action as rowing through the water.

Why is the 'wilde hond' of South Africa also called the 'hyæna-dog.'

Because it connects the dog and wolf tribe with that of the hyæna. In like manner the gnu forms a graceful link between the buffalo and antelope.

Why are the mastiffs of Cuba so highly prized by the natives?

Because they are eminently faithful, and as courageous as they are powerful, although by no means remarkable for their intelligence. They are chosen, in preference to all others, for house-guards and watch-dogs.

Why is the terrier so called?

Because it burrows the earth *(terra)* in pursuit of foxes. — *Caius.*

Why is the harrier so called?

Because it hunts the hare. — *Caius.*

Why was the bludhunde, or bloodhound, also called 'slothunde'?

Because *slot* means the impression left by the foot of the dog in the mire. This dog was remarkable for the acuteness of his smell, tracing any wounded game that had escaped from the hunter, and following the footsteps of the thief, let the distance of his flight be ever so great. The bloodhound was in great request on the confines of England and Scotland, when the borderers were continually preying on the herds and flocks of their neighbours, and was used also by Wallace and Bruce during the civil war. Pennant says, 'there is an order dated, so late as 1616, that no less than nine bloodhounds should be kept on the Border, upon Esk and other places mentioned.' — The hound is essentially the same as the bloodhound. The fox-hound is a smaller variety, and the harrier is still smaller. — *Cuvier.*

Why is the spaniel so called?

Because the race is derived from Spain; thence, *épagneul*, French, *spaniel*, English.

Why is the greyhound the first in rank among dogs?

Because, by the forest laws of Canute, it was enacted, 'that no one, under the degree of a gentleman, should presume to keep a greyhound;' also from an old Welsh saying, which signifies that you may know a gentleman 'by his hawke, his horse, his grehunde.' The greyhound is feelingly alive to caresses; and, when noticed, the motions of his heart are most violent and irregular. Caius, however, on the authority of Froissart, mentions the following fact, not much to the credit of the fidelity of this species: — When that unhappy prince, Richard II, was taken in Flint Castle, his favourite greyhound immediately deserted him, and fawned on his rival, Bolinbroke; as if he understood and fore-saw the misfortunes of his former master. This act of ingratitude the unfortunate monarch saw, and declared aloud to be the presage of his future death. — 'Ray, Linnœus, &c, give the name of *graius* to the greyhound, with which, however, the ancient Greeks do not appear to have been acquainted.' — *Note to Blumenbach.*

Why was the leviner, or lyemmer, so called?

Because of the lightness of the kind, (from *levis*, light) and the old word *lyemme*, a thong ; this species being used to be led with a thong, and slipped at the game.

Why is the mastife or mastiff so called?

Because it is a species of great size and strength, and a very loud barker ; whence *mastiff*, quasi *mase thefese ;* it being supposed to frighten away robbers by its tremendous bark.

Caius says three mastiffs were a match for a bear, and four for a lion. It appears that Great Britain was so noted for its mastiffs, that the Roman emperors appointed an officer in this island, whose sole business it was to breed, and transmit from hence to the amphitheatre, such dogs as would prove equal to the combats exhibited at that place.

Why was the old English hound so well qualified for hunting?

Because his hearing was very perfect, and his sense of smell was the most exquisite that could be imagined.

Why does the scent in hunting vary on different days?

Because of the varied condition of the ground, and the temperature of the air, which should be moist without being wet. If both are in this state, the scent is said to be perfect. When the ground is hard and dry, there will scarcely be any scent, and it hardly ever lies with a north or an east wind. A southerly wind, without rain, and a westerly one that is not rough, are the best; a warm day, without sun, is a perfect one. In some fogs the scent lies high; in others not at all.—*Notes on Science.*

THE WOLF.

Why was January called by the Anglo-Saxons 'Wolf-monat'?

Because, according to Verstegan, 'people were wont always in that moneth to be more in danger to be devoured of wolves, than in any season els of the yeare; for that, through the extremity of cold and snow, those ravenous creatures could not find of other beasts sufficient to feed upon.'

Why are the wolves white in the Arctic regions?

Because, probably, of the severity of the winter season, which causes their loss of colour; though the change does not occur in all cases.—*Sabine.* Desmarest, though he admits this change, notices the white wolf as a variety belonging to the peculiar description of animals called Albinoes.

THE JACKAL.

Why is the jackal called the lion's provider?

Because, at the jackal's cry, echoed by hundreds of similar voices, through the woods and plains, the lion, whose ear is dull, rouses himself to action, to join in the pursuit of some unhappy wanderer from the herds, which has crossed the jackal's path.

Why is the jackal difficult to domesticate?

Because of the strong odour which he emits, as filthy as that of the fox; and his extreme timidity at the sight of a stranger.

Why is the jackal serviceable in hot countries?

Because, like the vulture and hyæna, he does not require living prey to feed upon; but wherever there is an animal body putrefying, his nose scents it at a great distance, and the air is soon freed from the effluvium.

THE FOX.

Why does the fox seize his prey with his teeth?

Because his claws are thick, short, blunt, and cannot be drawn in; so that he cannot use them like the cat, or secure his prey otherwise than by the teeth.

Why does the fox hide himself in burrows in the day, and prowl about in a clouded night?

Because he may avoid the full blaze of day-light, which, becoming painful to his eyes, compels him to close their pupils, so as to render their vision very imperfect. Much of the cunning suspiciousness of manner for which the fox is notorious, arises from this circumstance: his attitudes and motions partake of the uncertainty of his sight, and he appears to be most cunning when he is really most short-sighted. —*Sec. Zoolog. Soc.*

Why is the cross-fox so-called?

Because he has a black cross on his shoulders: in shape he differs very little from the common fox.

Why is fox-hunting still kept up in England?

Because the breed is not extinct,—partly from the extreme prudence of the animal, and partly from its being considered unsportsmanlike to kill a fox, except in the chase.

Why is it considered that the three hundred 'foxes' to whose tails Sampson tied fire-brands, were jackals?

Because jackals assemble in large troops, so as to be taken in great numbers; whereas the fox is a solitary animal.

THE HYÆNA.

Why had the hyæna formerly the epithet of 'laughing'?

Because of a belief among the Greeks and Romans, that it imitated the human voice, and charmed shepherds, so as to rivet them to the spot upon which they were met by the quadruped, in the same way that a serpent fascinates a bird.

THE CAT TRIBE.

Why are the characteristics of feline animals so interesting to the naturalist?

Because animals of the cat kind are, in a state of nature, almost continually in action, both by night and by day. They either walk, creep, or advance rapidly by prodigious bounds; but they seldom *run*, owing, it is believed, to the extreme flexibility of their limbs and vertebral column, which cannot preserve the rigidity necessary to that species of movement. Their sense of sight, especially during twilight, is acute; their hearing, very perfect; and their perception of smell less so than the dog tribe. Their most obtuse sense is that of taste. In fact, the tongue of these animals is as much an organ of mastication as of taste; its sharp and horny points, inclined backwards, being used for tearing away the softer parts of the animal substances on which they prey. The perception of touch is said to reside very delicately in the small bulbs at the base of the mustachios.—*Wilson.*

Why does all the cat tribe possess such great strength of jaw?

Because the opening of the mouth is of great extent in proportion to the size of the animals; the muscles which move the lower jaw are also of great bulk, and the point on which they immediately act, is brought so far forward, in consequence of the breadth and shortness of the muzzle, as to give them the highest degree of attainable force.

Why are the claws of the cat tribe always sharp?

Because their edge and point is preserved by the animal withdrawing them in sheaths, enclosed within folds of skin, which cover the extremities of the toes.

THE LION.

Why has the lion been styled 'king of the beasts?'

Because, in strength, he surpasses all other animals. His generosity and courage are more doubtful. Mr Burchell, the African traveller, says: 'when men first adopted the lion as an emblem of courage, it would seem that they regarded great size and strength as indicating it; but they were greatly mistaken in the character they have given to this indolent, skulking animal, and have overlooked a much better example of true courage, and of other virtues also, in the bold and faithful dog.'

Why is the lion safely attacked while sleeping?

Because of the dulness of his sense of hearing, the difficulty of awakening him, and his want of presence of mind if he be so awakened. Thus, the bushmen of Africa are enabled to keep the country tolerably clear of lions, without encountering any great danger.

Why has the lion a terrific roar?

Because of the great comparative size of his larynx, or that part of the throat which forms the upper part of the windpipe; the principal organ of voice in all animals The absolute size of the larynx of the whale and the elephant is the largest, but relatively, the larynx of the lion has a still greater circumference.

Why is the bone of the lion's fore leg of remarkable hardness?

Because it contains a greater quantity of phosphate of lime than is found in ordinary bones; so that it may resist the powerful contraction of the muscles. The texture of this bone is so compact, that the substance will strike fire with steel.

Why does the lion draw in his claws when in quest of prey?

Because by this means, and the soft cushions of his feet, or fur upon which he treads, he is enabled to move towards his victim with greater stillness. The claws can, however, be instantly extended to seize the prey.

Why is the lion extremely strong in the fore-leg?

Because the muscles of that leg are unusually firm, as are also those of the thigh of a fighting cock. — *Home.*

Why has the lion superior firmness and pliancy of limb?

Because his joints are knit together by the remarkable strength of the muscles.

Why is the weight of the lion's body very remarkable as compared with his size?

Because of the extraordinary density of his muscles, and the compactness of his principal bones.

Why has the lion but litle sense of taste?

Because his lingual, or tongue, nerve, is not larger than that of a middle-sized dog. — *Desmoulins.*

Why should we discredit stories of lions licking the hands of men without injuring them?

Because the lion's tongue has sharp and horny points, inclining backwards, so as not to be able to lick the hand without tearing away the skin.

Why does the lion, when irritated, strike his sides with his tail?

Because he may excite himself by a prickle or spur at the extremity of the tail, and concealed in the tuft of long black hairs there. This circumstance is noticed by Homer, and Blumenbach some years since verified the existence of the prickle; but the fact was unnoticed by naturalists, till last year, when it was further corroborated, on the death of two lions in the Menagerie Royal at Paris. The prickle adhering only to the skin by the circumference of its base, is very easily detached.

THE DOMESTIC CAT.

Why is it evident that cats have been domesticated from the most remote antiquity?

Because the mummies of the cat found in the sepulchres of Thebes, and the figures sculptured on monuments bearing the names of the Pharaohs, concur with the Sacred Scriptures to prove, that in the earliest ages, the cat existed in Egypt and Palestine, in the domestic state.

*Why is the cat in China called '**Mao**' or '**Miao**?'*

Because of its resemblance to its cry.

Why do cats see in the dark?

Because the external rays of light, of which there is some in most dark places, after being concentrated by those parts which are called the *cornea* and the *crystalline lens*, are reflected in a brilliant concave mirror at the bottom of the eye, called the *tapetum*. — *(Home.)* This effect may be constantly seen in the domestic cat. In the strong light of the day, the *iris* is so contracted, that a very small quantity of light is admitted to this mirror; but in the twilight the *iris* opens, and then the mirror being completely exposed, the eye glares in the manner with which we are all familiar. The construction, therefore, of the eye of the cat tribe enables them to collect in one focus whatever light may be found; — and few places are so dark but that some light may be found; — as we know when we have gone into a cellar, where the darkness at first appears impenetrable, but where, even with our differently constructed organ of vision, we soon distinguish objects without difficulty. — *Lib. Ent. Knowl.*

Why does the pupil of the cat's eye serve to mark time?

Because it is like a thread at eleven at night, eleven in the morning, and five in the morning; like a jujubier nut at one in the morning, one in the afternoon, seven in the morning, and seven in the evening; and like the full moon at three in the morning, at one, nine, and eight in the evening. The tip of its nose is always cold, excepting on the day of the summer solstice, when it becomes lukewarm.—*Japanese Encyclopædia.*

Why does a cat shrink on the whiskers of her upper lip being pulled?

Because the whiskers are attached to a bed of close glands under the skin; and each of these long and stiff hairs is connected with the nerves of the lip.—*(Cuvier.)* The slightest contact of these whiskers with any surrounding object is thus felt most distinctly, although the hairs themselves are insensible.

Why does the cat lick herself?

Because the tongue is the chief instrument in cleaning herself, and is constructed somewhat like a curry-comb, or rather a wool-card, being bent with numerous horny points, bent downwards and backwards, and which serve several important purposes, such as lapping milk, filing minute portions of meat from bones, and especially, keeping the fur smooth and clean; and cats are by no means sparing in their labour to effect this. The female cat is still more particular with her kittens than herself, and always employs much time in licking their fur smooth.—*Mr Rennie—in Journ. Royal Instit.*

Why does the cat destroy mice?

Because its ruling passion is for animal food, or rather the desire to destroy a living animal. Hence, also, the cat devours insects, as flies, beetles, cockroaches, &c.

Why do cats bury their excrement?

Because of an instinct of distrust resulting from their wild state, which revolts against the feeling of domestication, because the strong smell of their excrements might reveal their retreat, and the abode and asylum of their young, which are to remain concealed. Thus, it is not from cleanliness, as generally supposed.

Why is it commonly thought that cats will always fall upon their feet?

Because of the facility with which they balance themselves when springing from a height; which power of balancing is in some degree produced by the flexibility of the heel, the bones of which have no fewer than four joints.

Why do cats alight softly on their feet?

Because in the middle of the foot there is placed a large ball, or pad, in five parts, formed of an elastic substance; and at the base of each toe is a similar pad. It is impossible to imagine any mechanism more calculated to break the force of a fall.

THE SLOTH.

Why is the sloth slow in his movements, and in a state of pain, when confined in a menagerie?

Because his feet are not formed for walking on the ground; they cannot act in a perpendicular direction: and his sharp and long claws are curved. He can only move on the ground by pulling himself along by some inequalities on the surface, therefore on a smooth floor he is wretched. He is intended to pass his life constantly suspended by his four legs from under the branches of trees, thus travelling from branch to branch, and sleeping when he is satisfied.

THE CAMEL.

Why is the camel used for travelling in the deserts of hot countries?

Because its feet are formed to tread lightly upon a dry and shifting soil; its nostrils have the capacity of closing, so as to shut out the driving sand, when the whirlwind scatters it over the desert; and it is provided with a peculiar apparatus for retaining water in its stomach, so that it can march from well to well without great inconvenience, although they be several hundred miles apart.

Why do camels travel in a single file?

Because if any of the loads get out of order, they can be adjusted by leading the camel out of the line, before those behind have come up; whereas, if they marched with a wide extended front, the whole caravan must stop when any accident happens to a single camel. — *Burckhardt.*

Why do camel drivers give camels three times their usual quantity of food before proceeding over a sterile district?

Because the construction of the stomach enables the animals to ruminate upon this supply of food during a very long march. — *Burckhardt.*

Why does the camel kneel down to receive its burthen?

Because soon after a camel is born, his owner ties his feet under its belly, and having thrown a large cloth over its back, heavy stones are put at each corner of the cloth, which rests on the ground. In this manner the camel becomes accustomed to receive the heaviest loads. — *Prevost, Voyages.*

Why is the camel's tread perfectly noiseless?

Because its feet are as soft as sponge or leather, being composed of an elastic substance, and covered with hair; wherefore the large creature moves along, under a very heavy load, with no greater noise than is made by the deer bounding over the grassy turf.

Why has the camel a hump on its back?

Because the soft, fatty substance of which the hump is composed, may, when the animal is without food in the desert, become absorbed into the system, and thus afford nourishment to the animal; the hump being renewed when the camel obtains pasturage.

Why are dromedaries used for riding?

Because of their superior swiftness to the heavy camel. Thus, the camel of the caravan, or the baggage camel, may be compared to the dray-horse; the dromedary to the hunter, and, in some instances, to the race-horse.

THE ANTELOPE.

Why are some antelopes called lyre antelopes?

Because their horns are in the shape of the lyre.

Why is a certain species of antelope called the springbok?

Because it takes remarkable flying leaps, rising with the back curved or elevated to the height of eight feet in the air, as if about to take flight. — *Burchell's Travels.*

Why is the age of the antelope in some measure to be estimated by its horns?

Because the horns, which appear in the seventh month, increase rapidly in size until the third year, when they have completed two spiral turns, and are marked by about twelve elevated rings. After this their growth is less rapid; but at six years old the number of convolutions is increased to three, and that of the circular rings to twenty-seven. They are then about thirteen inches in length, nearly close at the base, and about a foot apart at the points. At a still more advanced period they may attain sixteen, twenty, or even twenty-four inches in length; but the number of complete convolutions seldom reaches four.

Why are hawks flown at antelopes in hunting them?

Because the hawks keep the antelopes occupied until the dogs have time to come up with them and seize them.

Why is the term 'gazelle' figurative of perfect beauty?

Because the gazelle, a species of antelope, is one of the most elegant animals in nature. Its skin is beautifully sleek, its body extremely graceful, its head peculiarly light, its ears highly flexible, its eyes most brilliant and glancing, and its legs as slender as a reed. The Arabian describes his mistress as 'an antelope in beauty'—'his gazelle employs all his soul, &c,'—and Byron in speaking of the dark eyes of an eastern beauty, says, 'Go look on those of the gazelle.'

THE UNICORN.

Why has the existence of the unicorn been denied?

Because it is impossible that a ruminating cleft-footed animal could have one horn, as the unicorn is represented to have: since the frontal, or forehead bone being originally divided in two, a horn could not have grown in the centre of the division.—*Camper.*

Why is the unicorn supposed to represent the horned antelope?

Because the idea of the unicorn has probably arisen from the coarse figures traced by savages on rocks: ignorant of perspective, and wishing to present in profile the horned antelope, they could only give it one horn, and thus originated the unicorn. The unicorns of the Egyptian monuments are most probably but the productions of a similarly crude style, which the religion of the country imposed on the artist. Many of the profiles of quadrupeds have only one leg before and one behind: why then should they show two horns? It is possible that individual animals might be taken in the chase, whom accident had despoiled of one horn, as it often happens to chamois and the Scythian antelope: and that would suffice to confirm the error which these pictures originally produced. It is thus, probably, that we find anew the unicorn in the mountains of Thibet.—*Cuvier.*

THE CHAMOIS.

Why does the chamois safely bound over wide chasms of rocks?

Because of his extraordinary power of balancing the body — of instantly finding the centre of gravity, — and peculiarity of all the goat tribe, to which the chamois is nearly allied. The ability of the eye to measure distances, with such undeviating exactness, is associated with this power of finding the centre of gravity. — *Lib. Ent. Knowl.*

THE OX.

Why is the hump of the zebra or Indian ox highly prized?

Because it is chiefly composed of fat, and is reckoned the most delicate part. The whole of the breeds are treated with great veneration by the Hindoos, who hold it sinful to kill them.

Why are certain cows called Alderney?

Because the breed *originally* came from Alderney, a single British island, containing only one village. It is high, rugged, and encompassed by dangerous reefs, and the islanders have very little intercourse with the rest of the world.

Why is the lower smaller than the upper jaw of a cow?

Because the cow and all other ruminating animals have their grinding teeth intersected by indented transverse furrows, and the crowns are not placed horizontally, but incline obliquely, so that in the upper jaw the outer side is highest, and in the lower, that next the tongue.

THE GIRAFFE.

Why is the giraffe also called a camelopard?

Because the Romans, who so named it, fancied it a combination of the characters of the camel and leopard: its ancient denomination was *Zurapha*, whence the name giraffe.

Why were the descriptions of the camelopard formerly received as fabulous?

Because of the absence of the animal from Europe, for three centuries and a half; whence, its extraordinary height and apparent disproportions caused it to be classed with the unicorns, sphinxes, &c, of ancient poets and naturalists.

Why were the legs of the giraffe once said to be longer before than behind?

Because of the height of the withers, which according to the animal's age, may exceed the height of the rump by sixteen or twenty inches, and which disproportion, when seen at a distance, must have led to the above erroneous inference. — *Le Vaillant.*

Why does the tongue of the giraffe differ from that of other animals?

Because it not only is the organ of taste, but has besides nearly all the powers of the proboscis of the elephant, although not possessed of the same strength. They differ, indeed, in one being an elongation of the organ of smell — the other of the organ of taste. — *Sir E. Home.*

Why does the giraffe move awkardly?

Because of the disproportion of the hinder parts of its body, and the immense length of the neck, which, instead of being arched, forms an angle with the shoulders. In walking it moves the fore and hind foot of the same side together, like an ambling horse, from which circumstance it has a very remarkable motion, whence — the move of the knight at chess is derived. — *Blumenbach.*

DEER.

Why is the fur of the rein-deer used by all the tribes of the arctic circle, for winter clothing?

Because the hairs composing the coat of the deer are so thick, that it is hardly possible to discern the least portion of the naked hide; and 'a suit of clothing made of this skin is so impervious to the cold, that, with the addition of a blanket of the same material, any one so clothed may bivouack on the snow with safety, in the most intense cold of an arctic winter's night.' — *Dr Richardson.*

Why is the rein-deer a serviceable beast of burden?

Because of the great strength of its shoulders and fore-quarters, and the muscularity of its loins.

Why do the Laplanders migrate with their herds of rein-deer from the interior to the coast of Lapland?

Because the interior, particularly its boundless forests, is so infested by stinging insects, that no animal can escape their incessant persecutions, but by fleeing to the coast; the cool sea-breezes being unfavourable to the insects.—*De Broke's Travels.*

Why does the rein-deer produce a crackling noise while running?

Because of the contraction of its hoofs, when the foot is raised from the ground.

Why are the hoofs of the rein-deer broad and spreading?

Because the foot may present a large surface when the rein-deer crosses the yielding snows; and, like the snow-shoe of the Norwegians and Canadian Indians, assist to prevent the animal sinking so deeply as it would if the hoof were small and compact, like that of the fallow deer, which finds its food upon unyielding surfaces.

FALLOW-DEER.

Why does the fallow-deer, while drinking, plunge and keep its nose under water for a considerable time?

Because it has two spiracula or breathing-places besides the nostrils; one at the inner corner of each eye, having a communication with the nose.—*G. White.*

Why was stag-hunting in England formerly very perilous?

Because when the stag turned to bay, the ancient hunter went in upon, and killed or disabled, the desperate animal. At certain times of the year this was held particularly dangerous, a wound received from a stag's horn being then deemed poisonous, and more dangerous than one from the tusks of a boar, as the old rhyme testifies: —

> 'If thou be hurt with hart, it brings thee to thy bier,
> But barber's hand will boar's hurt heal, thereof thou need'st not fear.'
>
> *Sir Walter Scott.*

Why do antlers differ from horns?

Because the antler is a real bone; it is formed in the same manner, and consists of the same elements as other bones.—*Notes to Blumenbach.*

Why is hart's-horn jelly nutritious?

Because the horn of the stag contains a large proportion of gelatine.

Why is the deer poetically said to weep?

Because, in the heads of deer and antelopes, there are cavities imbedded in a bony case, and believed by French naturalists to be receptacles for tears, of which the thinner part evaporating, a substance remains, called by them, *larmes de cerf*, or deer's tears, the receptacles themselves being called *larmiers.*

Why is the deer as strong as he is fleet?

Because of the peculiar hardness of the bone of his foot.

Why is the fallow-deer often seen domesticated in stables?

Because he manifests a sort of affection for the horse.

Why were sheep formerly excluded from grazing on forests?

Because being such close grazers, they would pick out all the finest grasses, and hinder the deer from thriving.— *G. White.*

In the Holt, where a full stock of fallow-deer has been kept up till lately, no sheep are admitted to this day.

SWINE.

Why do swine roll themselves in mire?

Because they may protect themselves from flies, by the mud when dry; and not from any liking or inclination for uncleanness, particularly as no animal is more careful to have its bed clean and dry, than the pig.—*Rennie.*

THE ELEPHANT.

Why does the elephant move differently from the horse?

Because, without reckoning the joint which unites the hoof, the horse has three bones in the leg—the elephant has two. Thus the horse moves with an elastic pace, while the elephant has a grave or stiff progression; and this want of elasticity renders it disagreeable to ride on him for any distance. The peculiarity of his movement is generally attributed to the weight of the elephant's body, which, in some instances, is upwards of 5000lbs.

Why is the elephant one of the safest beasts of burden?

Because its step is so sure that it never stumbles, even on the worst roads.

Why is the elephant the natural inhabitant of rich plains, where vegetation attains its utmost luxuriance?

Because of the simple construction of his stomach and intestines, which require frequent supplies; of the great quantity of food which he consumes for his ordinary support; of the waste which is necessarily produced by the weight and bulk of his body; and of the conformation by which he is fitted to move on level ground.

Why are more cells filled with air in the skull of the elephant than in other animals?

Because the surface may be increased for the attachment of those large muscles which belong to the lower jaw, proboscis, and neck of the elephant, and the mechanical power of these muscles, may be augmented by removing their attachments further from the centre of motion. These air-cells do not increase the weight of the head; a precaution especially necessary in this instance, as the head is more heavy and massy in this than in any other animal.—*Lib. Ent. Knowledge.*

Why are the scent and hearing of the elephant remarkably acute?

Because, living in troops, but often dispersed for food, they may gather together without difficulty. Elephants are known to discover a tiger-track by the smell.

Why does not the elephant smell with his trunk?

Because the passage of any liquid through the canals of the trunk would not accord with the delicacy of the lining of the nostrils in the head. Thus man is in pain when any liquid enters the nose; and, in like manner the sense of smell does not exist in the nostrils of those animals that are constantly using them as a passage for water, as the whale. The sense of smell in the elephant is confined to that part of the nostrils which is enclosed in the bones of the head.—*Cuvier.*

Why does the elephant throw up his trunk when attacked by the tiger?

Because it may be as far as possible out of reach, and if the trunk be once scratched by the tiger, the elephant becomes ungovernable.

Why does the trunk of the elephant seize upon large and small objects with equal certainty?

Because the muscles of the trunk, which are nearly 40,000, have the power of distinct motion.—*Cuvier.*

Why, in crossing rivers, is the elephant safe when his body is completely immersed in water?

Because it is only necessary for him to bring the tip of his trunk to the surface, so as to breathe the external air.

Why are the elephant's tusks now brought to Europe, of smaller size than formerly?

Because herds of elephants are scarce in the present day, and those which are found are unsparingly hunted for their ivory; so that probably few elephants live the natural term of their life.

Why are the tusks of the elephant teeth, and not horns, as was once supposed?

Because, although ivory, they are formed like other teeth by successive secretions from a pulpy root. The tusk does not adhere to this root, but is held in its socket as a nail is held in a plank, by the elasticity of the parts alone.

Why are the tusks of an elephant an uncertain standard for estimating his size?

Because the tusks grow throughout the life of the animal, and the body does not.

Why are the teeth of the elephant renewed whent hey are worn out?

Because he may masticate not only a larger quantity of food than other animals, but through a long series of years. — 'The teeth of the elephant last a century: if the animal were to grow to double its present size, there is a provision for the continuance of the teeth: but as soon as the growth of the jaw is arrested, the succession of the teeth is arrested also, which fixes the duration of the animal's life. — *Sir E. Home.*

Why does the elephant sleep in a standing position, against a tree?

Because his tusks furnish him with support, and placing them against the tree, he relieves the weight which his head carries, and enjoys a partial repose with tolerable ease.

Why is the elephant a peaceable animal?

Because he subsists upon vegetable food, and therefore has neither the desire to destroy life, which characterizes the carnivorous animals, nor the means of gratifying such a desire.

Why is the elephant sometimes white?

Because it is an Albino: that is, an animal made white by disease.

Why is the general use of elephants forbidden at and near Calcutta?

Because they might occasion frequent accidents by frightening horses. — *Heber.*

Why is the white elephant part of the royal train at Ava?

Because the court and people would consider it as peculiarly inauspicious to want one of these animals; and the more there are, the more perfect is the kingly office considered. — *Craufurd's Travels.*

Why has the elephant superstitiously been considered a religious animal?

Because of an exaggerated notion of the animal's sagacity.

Why has the employment of the elephant been discontinued in modern warfare?

Because of his terror of fire-arms, which makes him unmanageable, and destructive of both friends and foes.

Why does the elephant appear more sagacious than he really is?

Because the facial line, or the vertical height of the skull, when compared with its horizontal length, is elevated by causes which have no connexion with the volume of the brain.

Why is the elephant proud of his trappings?

Because he is accustomed to wear them upon pompous ceremonials, where he receives impressions in unison with the parade of the scene.

Why is the elephant employed in hunting the tiger in India?

Because of his delicate scent, his strength to make way through the thickest covers, his sagacity, and especially his great stature, by which the hunter is lifted out of danger.

HIPPOPOTAMUS.

Why is the ivory tusk of the Hippopotamus preferred for artificial teeth?

Because it does not, from exposure to the air, turn yellow so soon as the ivory of the elephant, and is also at first harder and whiter.

THE RATEL.

Why is the subsistence of the ratel entirely on honey, doubted by naturalists?

Because its teeth correspond more closely with those of cats than any other quadruped, and exhibit a carnivorous character, scarcely, if at all, inferior to that of hyænas.

Why does the ratel attack bees with impunity?

Because of the roughness of its hide. Such is its tenacity of life, that 'it is a species of amusement for the farmers at the Cape, to run knives through different parts of its body, without being able for a length of time to deprive it of existence.'—*Barrow.*

THE HORSE.

Why is the ear of the horse so interesting a part of his anatomy?

Because it is one of the most beautiful parts about him, and even more intelligible than the eye; and an observer of the horse can tell, by the expressive motion of the ears, almost all that he thinks or means.

Why is it a good sign for a horse to carry one ear forward and the other backward, when on a journey?

Because this stretching of the ears in contrary directions, shows that he is attentive to every thing that is taking place around him, and, while he is so doing, he cannot be much fatigued, or likely soon to become so. Few horses sleep without pointing their ears as above, that they may receive notice of the approach of objects in every direction.

'When horses or mules march in company at night, those in front direct their ears forwards; those in the rear direct them backwards; and those in the centre turn them laterally or across; the whole troop seeming thus to be actuated by one feeling, which watches the general safety.—*Arnott.*

Why does the eye of the horse point a little forwards from the side of the head?

Because the animal may have a more extended field of vision.

Why does not the loss of one eye enfeeble sight?

Because the other acquires greater energy; though it much contracts the field of vision. It is said to render the conception erring, and the case of misjudgment of distances is the one commonly brought forward to show this. One-eyed horses, have, however, been found extraordinary leapers.

Why is it a vulgar error to suppose wall-eyed horses not liable to blindness?

Because there is no difference of structure which can produce this exemption; but the wall-eyed horse, from this unseemly appearance, and his frequent want of breeding, may not be exposed to many of the usual causes of inflammation.

Why does the pupil of the eye expand when a horse is brought to the door of the stable?

Because it may keep out the extra quantity of light, which would be painful to the animal and injurious to vision. When opposed directly to the sun, the pupil, or aperture in the iris, will almost close.

Why was the inflammation of the horse's eye formerly called 'moon-blindness'?

Because of its periodical return, and some supposed influence of the moon; an absurdity which is its own contradiction.

Why are the eyes of horses kept clean?

Because, like birds, they have a kind of third eyelid, called the *haw,* moistened with a pulpy substance or mucilage, to take hold of the dust on the eye-ball, and wipe it clean; so that the eye is hardly ever seen with any thing on it, though greatly exposed from its size and posture.

Why do horses shy as they grow old?

Because of a decay in their sight; a loss of convexity in the eye, lessening the convergency of the rays, and throwing the perfect image beyond, and not on the retina.

Why are the teeth a criterion of the horse's age?

Because the incisor or front teeth of the horse have a production of enamel in their centre; but the cavity which this forms, containing no cement, is merely filled by the particles of food, &c. As the enamel descends only to a certain extent in the tooth, the teeth disappear at last, from the constant wear of the part in mastication; and this is improperly called the filling up of the teeth.—*Blumenbach.*

Why are the grinders of the horse never perfect?

Because the tooth is not finished when it cuts the gum: the lower part of its body is complete, while the upper part is worn away by mastication, and the proper fang is not added till long after. Thus, if the part out of the gum is complete, the rest of the body is imperfect, and there are no fangs: on the contrary, when the fangs are formed, much of the body has been worn away in mastication.—*Blumenbach.*

Why has the horse the pack-wax, or a strong cord from the back of the head to the bones of the back?

Because the head hangs in a slanting position from the extremity of the neck, and the neck itself projects considerably from the chest; thus the whole weight of the head and neck is suspended from the chest, and very great power is requisite to support them. In addition to the simple weight of the head and neck, the neck projecting from the chest, and the head hanging from the extremity of the neck, act with enormous mechanical force, and require more than a hundred-fold the power necessary to support them. As an illustration, it may be observed, that it requires a strong man to lift a small table from the ground at arm's-length.

Why are large nostrils a perfection in hunters and running horses?

Because they afford the animals freer respiration when they are hard-ridden or run.—*G. White.*

Why are horses with white legs and feet less valuable than those which have them not?

Because, even in a wet soil and climate, white hoofs are more brittle, and more liable to accident and lameness than black ones; and in stony soils white hoofs are much more liable to break and to contract than those of a dark colour.

Why is it difficult to distinguish the species of a horse from the inspection of his bones?

Because the size can scarcely be assumed as a specific character, it varying remarkably in the same species. Hence the bones of fossil horses present no precise character to distinguish them from the medium-sized existing species.

Why does a bulky, heavy horse make less progress than a compact muscular animal?

Because the fat horse makes but little exertion, much of his force being expended in transporting his own overgrown mass.

Why does the speed and wind of the horse depend on the size of the lungs?

Because in proportion to the quantity of air which they contain, and the less frequent necessity of renewing that air by breathing, will the animal be at his ease, or distressed, when violent exertion is demanded of him.

Why does the rider sit almost undisturbed on the back of a fast-going horse?

Because the back is divided into numerous bones, and between each pair there is a highly elastic substance, which will yield and give way to every jar,—

forming altogether a springy mass. If the back were of unyielding materials, if it resembled a bar of wood or iron, the jar or jolting, in the rapid motion of the animal, could not possibly be endured.

Why is a long-backed horse easy in his paces?

Because the increased distance between the fore and hind legs, which are the supports of the spine, will afford greater room for the play of the joints of the back. A long spring has much more play than a short one, and will better obviate concussion.

Why does a horse improve his pace when whipped on the hips?

Because his organ of touch is situated in the hips, which are furnished with many nerves.

Why does a horse grunt when exercised on a full stomach?

Because the pressure of the stomach on the lungs impedes the breathing.

Why are jockies correct in the term 'blood and bone,' to distinguish the breed and genealogy of horses?

Because blood is an allowable term for the race, and bone is so far significant, that the bone of a running-horse is remarkably compact, compared with the bone of a draught-horse. It will be readily understood, that the space in the gallop must give a shock in proportion to its length; the greater the muscular power, the denser and stronger is the bone.

Why do jockies judge of a horse by his sinews or tendons?

Because the condition of the tendon indicates the state of the muscle; the muscular fibres forming what is termed the belly of the muscle, and the tendon through which the muscle pulls, being two parts of one organ. Strong muscles being powerful contractors, cause high and round action, and such horses are safe to ride. Their feet are generally preserved good, owing to the pressure they sustain from their high action. But this excellence in a horse will not make him a favourite at Newmarket. The circular motion cannot be the swiftest: a blood-horse carries his foot near the ground.

Why is strength of sinew in the fore-legs essential to the speed of a horse?

Because the feet may be well thrown out before; for if these sinews be not strong, the joints will be unable to sustain the weight of his body, when powerfully thrown forward, by the exertion of his hind-quarters, and he will be apt to come with his nose to the ground.

FOREIGN HORSES.

Why does the Arabian horse probably differ least from the native stock, and rank first in our domestic races?

Because, instead of crossing the breed, as we so frequently do, the Arabs take every precaution to keep it pure and unmixed. They preserve, with the greatest care, the genealogies of their horses: those of the first kind are called *nobles*, being 'of a pure and ancient race, purer than milk;' two other kinds, which have been degraded by common alliances, sell at lower prices. The Arabs say the genealogy of their finest horses is known for 2000 years.

The Greek sporting-men held the same opinion, long before the Arab horse was known. 'What chance have I of winning?' inquired a youth whose horse was about to start on the Olympic course. 'Ask the *dam* of your horse,' was the experienced reply.

Why are the horse and the ass used by the Arabians and Tartars to discover springs in the desert?

Because both these animals are, in some measure, aware of the existence of water from a great distance. — *Wilson, in the Quarterly Journ. Agriculture.*

Why are the horses of Arabia, Persia, and Barbary, the most beautiful and perfect of their kind?

Because of the fine climate of those countries, where the heavens are almost perpetually serene; the atmosphere is very dry, and the soil light, and for the most part sandy. In Europe, the Spanish breed, which enjoys a climate less different from that of the east than most European countries, is *naturally* the finest on our continent. The strength, beauty, and swiftness of English horses are rather to be attributed to the wealth, perseverance, and peculiar fancies of the English nation, than to any natural advantages of climate. — *Wilson.*

Why is a certain species of horse called a Barb?

Because the breed is from Barbary, in Africa.

Why do the Arabs reckon the genealogies of their horses from the mothers?

Because the female is more concerned than the male in the excellence and value of the produce.

Why has the Arab horse an apparent sagacity seldom seen in other breeds?

Because of the kindness with which he is treated from a foal. The mare and the foal inhabit the same tent with the Bedouin and his children; and the animal acquires that friendship and love for man which occasional ill-treatment will not cause him to forget.

Bishop Heber says his Arab horse had 'almost as much attachment and coaxing ways as a dog. This seems the general character of the Arab horse. It is not the fiery dashing animal I had supposed, but with more rationality about him, and more apparent confidence in him, than the majority of English horses.'

Why are the wild horses in the plains of America, to the south of the Rio de la Plata, called 'insurgent?'

Because, in troops sometimes of 10,000 individuals, preceded by videttes and detached skirmishers, they advance in a close column, which nothing can break. If a travelling carriage, or a body of cavalry is perceived approaching, the leaders of the wild horses advance upon a reconnoissance, and then, according to the movements of the chief, the whole body passes at a gallop to the right or left of the caravan; inviting, at the same time, the domestic horses to desertion. The latter often join their late companions, and are never again observed voluntarily to return to the domestic state. These wild troops often return again with a threatening aspect, sweeping round the caravan, or hovering near it like a cloud. At other times, they describe a single bold circle, and, after uttering a cry of defiance, they disappear over the wilderness. Each of these great squadrons is composed of a reunion of small companies, separately formed of as many mares as a single horse is able to keep in subjection.—*Wilson.*

Why do wild horses, in travelling to a distant pasture, always run against the wind?

Because they may be more speedily apprized of whatever danger may await them in their intended course.

Why are the horses of Sweden finely limbed and sure-footed, notwithstanding the cold and moist climate?

Because of the great precautions used to defend them from humidity, even in the stable; by which means they are preserved from those defluxions which so frequently attack horses in moist climates.

THE BRITISH HORSE.

Why are English race-horses named 'first blood'?

Because they are as near as possible to the foreign stock.

Why is the great Lincolnshire black horse now but rare in the cavalry of England?

Because, in active service, its great size renders it unwieldy; wherefore, others of a smaller but more active kind are preferred.

Why has the Suffolk Punch immense power?

Because the low position of his shoulder enables him to throw so much of his weight into the collar.

Why is the Clydesdale horse so called?

Because it is principally bred in a district on the Clyde, in Scotland.

Why is the Galloway so called?

Because of its origin from a breed of horses once found in the south of Scotland, on the shore of the Solway Firth.

Why is the Irish horse generally smaller than the English?

Because he is stinted in his growth, from the poverty and custom of the country imposing on him much hard work, when he is unfit for labour of any kind.

Why is the leaping of an Irish horse superior to the English?

Because the leap of the Irish horse is the proper jump of the deer; whereas the leaping of the English is striding, as it were, over a low fence, and stretching at his full length over a higher one.

Why was horsemanship, in former times, of a higher order than in the present day?

Because its objects, war and gallantry, with their attendant virtues, courage and chivalric honour, were more ennobling in their effects than the gambling zeal of St Leger.

Why are bells placed on horses?

Because they were a favourite addition to the equipment of a horse in the early times of chivalry. An old Troubadour poet, Arnold of Marsan, states very grave reasons for wearing them. He says, 'Let the neck of the knight's horse be garnished with bells, well hung.' Nothing is more proper to inspire confidence in a knight, and terror to an enemy. The war-horse of a soldier of a religious order of knighthood might have his collar of bells, for their jangling was loved by a monk himself—

And when he rode, men might his bridle hear,
Gingleing in a whistling wind as clere,
And eke as loud as doth the chapel bell.

Why were the old English war horses necessarily very heavy?

Because the soldier was cased in ponderous armour, and the knight, with all his accoutrements, often rode more than 25 stone. No little bulk and strength were therefore required in the animal destined to carry this back-breaking weight.

Why was the price of the English horse formerly regulated by proclamation?

Because breeders and dealers, then, as now, skilful in imposing on the inexperienced, obtained from many of our young grandees enormous prices. Such was the value of English horses in 1386, when Richard I issued a proclamation for the above purpose.

Why is the use of the pack-horse discontinued?

Because of the great modern improvements in roads and carriages.

The gigantic proportions and immense powers of our dray-horses are only equalled by their intelligence and docility. It may safely be said, that this breed of horses is not to be paralleled on the face of the earth. — *Cuvier.*

One of our powerful draught horses of London, will draw, for a short distance, the enormous weight of three tons.

Why is horse-racing less cruel than is generally imagined?

Because the horse enters into the spirit of the race as thoroughly as does his rider: indeed, the jockey becomes a part and portion of him; every motion of his arms and body corresponding with and assisting the action of the horse.

Why do we use the phrase of 'bearing away the bell?'

Because the prize in horse-racing was, formerly, a wooden bell adorned with flowers. This was afterwards changed for a silver bell, and 'given to him who should run the best and furthest on horseback, on Shrove Tuesday.'

Why are horses so short-lived in England?

Because of the absurd practice of running our race-horses at two or three years old, working others long before their limbs are knit, or their strength come, and cruelly exacting from them services far beyond their powers. Their age does not average eleven years. Cuvier says that 'it may safely be asserted, that more horses are consumed in England, in every ten years, than in any other country in the world, in ten times that period, except those which perish in war.'

Why does the pace kill horses in posting?

Because a horse at a dead pull, or at the beginning of his pull, is enabled, by the force of his muscles, to throw a certain weight into the collar. If he walk four miles in the hour, some part of that muscular energy must be expended in the act of walking; and, consequently, the power of drawing must be proportionally diminished. If he trot eight miles in the hour, more animal power is expended in the trot, and less remains for the draught; but the draught continues the same, and to enable him to accomplish this work, he must tax his energies to a degree that is cruel in itself, and that must speedily wear him out.

THE ZEBRA.

Why was the zebra called by the Romans a hippo-tiger, or horse-tiger?

Because it possesses the proportions of a horse, with the striped hide of a tiger.

THE ASS.

Why does the ass choose the narrow and irregular paths by the way-side?

Because his natural locality is the mountains, and this choice is probably a remnant of instinct. The base on which he is sustained, while walking, is extremely narrow, and is produced by the vertical compression of the body, — from which necessarily results greater sureness of foot, while moving rapidly over a narrow surface, than is to be found in those animals whose feet touch the ground at proportionally greater distances. — *Wilson.*

Why are the hind quarters of the ass naturally several inches higher than its fore ones?

Because it is a mountain animal, and this inequality, as in the hare, facilitates its ascent of steep heights.

Why is the skin of the ass called 'chagrin,' corrupted into shagreen?

Because of its derivation from the Turkish *sagri*. — *Wilson.*

Its engrained appearance is not, however, natural to it, but is produced by a chemical process.

Why is an ass, eating thistles, vulgarly thought emblematical of the ridiculous?

Because it is related that Crassus, a distinguished Roman, never laughed in his life but once, and that at an ass eating thistles: 'a circumstance,' says Dr Shaw, 'by no means ridiculous.'

THE MULE.

Why does the mule bray like the ass?

Because it possesses exactly the same larynx as the ass, without any of the peculiar vocal organs of the mare or mother.

THE MOLE.

Why has it been asserted that the mole does not see?

Because, although naturalists have found the eye, anatomists do not find the optic nerve, which, in other animals, serves to transmit the visual sensation to the brain.

Why is not this nerve evident in the mole?

Because it is prevented, by the great extension of the olfactory apparatus, from following the course which is taken in other animals.

The eye of the mole is very small, in the bulk, at the most, of a grain of millet; in colour, ebony, and hard to the touch. Besides the eye-lid which covers it, it is protected by long hairs, which, crossing one another in all directions, form a thick and closely-woven band.

Why does the breast bone of the mole in shape resemble a plough-share?

Because it may assist the animal in digging under ground.

Why does the fine fur of the mole yield in every direction, and offer no resistance to the touch?

Because the mole may not be impeded in its retreat, while retiring backwards, as it always does upon suspicion of peril, not turning round, which the size of its runs does not permit, but tail foremost, until it arrives at some collateral gallery, when its flight is head foremost, as with other creatures. If this fur had been strong, as in the rat or mouse, it would doubly have retarded the progress of the creature: first, by its resistance, and then, acting as a brush, so as to choke up the galleries, by removing the loose earth from the sides and ceilings of the arched ways. — *Knapp.*

Why is the smell of the flesh of the mole remarkably offensive?

Because its sole food is worms.

It is doubtful whether any other animal exists, which is obliged to eat at such short intervals as the mole. Ten or twelve hours appear to be the maximum of its fasting; at the end of that time, it dies. They are essentially carnivorous: Cuvier tells us that if two moles are shut up together without food, there will shortly be nothing left of the weakest, but its skin, slit along the belly.

Why do mole-catchers draw the body of a captured *mole through their traps, and the adjoining runs and passages?*

Because they may remove all suspicious odours, which might arise from the touch of their fingers, the mole's sense of smelling being unusually acute. — *Knapp.*

Why do mole-catchers tread lightly when in quest of moles?

Because the feeling of the mole is so acute, that, when casting up the earth, it is sensible of the pressure of a very gentle foot; and unless this caution is used, it ceases from its operation, and instantly retires. — *Knapp.*

Why are moles said to be beneficial to vegetation?

Because they loosen the soil about the roots of plants. Evelyn and others censure them as injurious; and Buffon accuses them of eating all the acorns of a newly-set soil.

Why are some mole-hills considerably larger than others?

Because the nest or den of the mole is beneath.

Why are there no moles in Ireland?

Because, it is supposed, of the dampness of the soil.

THE BEAVER.

Why have beavers very powerful incisor teeth?

Because they may strip off and divide the bark of the trees, which forms their principal nutriment, and gnaw through thick trunks to obtain the timber for building their habitations. Their teeth are reproduced from the base as fast as they are worn down at the extremity. By good authority it is stated that a beaver will lop off with his teeth, at a single effort, a stem of the thickness of a common walking-stick, as leanly as if done by a gardener's pruning-knife.

Why has the beaver a long, broad, flat tail?

Because it may serve in the water, as a paddle and a rudder, to urge then onwards and to direct them in their course. The stories of the beaver using its tail as a sledge, and as a trowel, are impositions on the credulous. The tail is altogether unfitted for such operations: for mixing up the mud with the rest of the materials, it employs the fore-paws and the mouth.—*Sec. Zoolog. Soc.*

Why is the winter season preferred for taking beavers?

Because the winter coat is far superior to the summer. The skin of the young or cub-beaver is the darkest and most glossy, and consequently the most valuable.

Why was the fur of the beaver universally used, at an early period, for making hats?

Because of a proclamation issued in the year 1638, forbidding the use of any materials in making hats, except beaver stuff or beaver wool.

Why do the hind feet of the beaver turn in?

Because it may keep its fur in order, and cleanse it from dirt and moisture, which the beaver could not do if the toes were straight.

THE SEAL.

Why does the seal see equally well under water, as in air?

Because it can lengthen or shorten the axis of the organ of sight at pleasure, and thus see equally well in two media of very different density, viz, air and water.

Why is a species of seal called the sea-lion?

Because of the lion-like mane of the male.

Why is another species of seal called the sea-elephant?

Because it has a nose resembling the proboscis of the elephant.

Why is the nose of the seal considered by physiologists to be the most perfect nose belonging to the class of quadrupeds?

Because it has been computed that the smelling surface in the nose of a single seal amounts to the enormous quantity of 240 square inches.

Why is the seal so valuable to the Esquimaux?

Because it furnishes food for his table, oil for his lamp, clothing for his person; even the bones and skins of seals supply materials for his light portable boats, and his summer tents.

Why is the domestication of the seal much easier than that of other animals?

Because its brain is of greater proportionate magnitude than in any other quadruped, and not only does it exhibit in its countenance the appearance of sagacity, but its intelligence is in reality far greater than in most land quadrupeds. It is likewise susseptible of more powerful attachment, and Dr Harwood observes, that, aware of its disposition to become familiar, and this participation in the good qualities of the dog, it is astonishing that mankind have not chosen this intellectual and finely organized quadruped, for aquatic services, scarcely less important than some of those in which the dog is employed on land. —*Brande's Journal.*

THE ORNITHORYNCUS.

Why is the ornithoryncus called the duck-billed animal?

Because it is distinguished from all mammiferous animals yet known by the unprecedented formation of its jaws, which closely resemble the broad flat bill of a duck, are covered in the same way with a soft membrane, plentifully supplied with nerves for tasting, and also, like it, serrated at the natural edges. The feet are provided with webs, which, in the front ones, project beyond the claws, and can by that means be folded up or expanded like a fan. No appearance of teats has hitherto been discovered in either sex. This wonderful animal lives near the lakes about Botany Bay, in the fifth part of the world, so rich in creatures of remarkable formation. — *Blumenbach.*

THE WALRUS.

Why is the great walrus able to climb slippery rocks?

Because its hind feet are constructed upon a mechanism resembling cupping-glasses.

Why is the walrus supposed to have been mistaken for a mermaid?

Because the front face, when seen at a little distance, has a striking resemblance to the human countenance.

Why does the walrus lie on the ice of the Arctic regions, without inconvenience?

Because, as a defence against the extreme cold, it has not only a skin an inch thick, covered with close hair, but a coating of oily fat, completely enveloping the body.

MERMAIDS.

Why is the dugong believed to be the mermaid of early writers?

Because, of all the cetacea it approaches the nearest in form to man; and when its head and breast are raised above the water, and its pectoral fins, resembling hands, are visible, the dugong might easily be taken by superstitious seamen for a semi-human being. The dugong is the only animal yet known that grazes at the bottom of the sea without legs. It is of the form and figure of the whale. The position and structure of the mouth enable it to browse like a cow in a meadow, and the whole structure of the masticating and digestive organs, shows it to live entirely on vegetables. It never comes on the land, or into fresh water, but frequents shallow inlets of the sea of two or three fathoms deep. The length of the dugong is eight or nine feet, and the flesh, when cooked, entirely resembles young and excellent beef.

The manatus, or lamantine is said to carry its young between its paws, and when viewed in this attitude, it may have given rise to the belief in the mermaid.

THE WHALE.

Why is the whale so called?

Because of its derivation from *wal-fisch*, or *wallow* fish.

Why are whales classed with mammalia?

Because, although their home be entirely in the depth of the waters, they have several features in common with the larger quadrupeds.

Why is the whale not a fish?

Because its lungs, heart, intestines, &c, resemble those of quadrupeds; they breathe by lungs, not by gills; suckle their young; have no scales, and a horizontal tail, the reverse of fishes.

The whale is the largest of all known animals, weighing upwards of one hundred thousand pounds. Those that are taken at the present day are rarely longer than from sixty to seventy feet.

Why are the whale tribe called Cetacea, or Cetaceous animals?

Because *Cete* in Latin signifies whales.

Why are whales and other cetacea without the lacrymal apparatus?

Because their eyes are preserved in a moist state by the element in which they live.

Why is the brain of the cetaceous tribe considered small in comparison with the size of the body?

Because the brain of a common whale, nineteen feet in length, has been found by Mr Scoresby to weigh about 3¾ pounds, although the weight of the animal was nearly 11,200lbs. Here the weight of the brain was about one-thousandth part of that of the body, whilst that of the brain of an adult man is about 4lb, and that of the body 140, the brain being the one-thirty-fifth part of the weight of the whole body.—*Notes to Blumenbach.*

Why do whales rise to the surface of the water to breathe?

Because they have a heart with two ventricles (or cavities,) and lungs through which they respire; and are unable to separate the air from the water, as fishes do by means of their gills. Hence it is a vulgar error to call the whale a fish; yet he is entirely an inhabitant of the sea, having a tail, while his front limbs much more resemble fins than legs, and are solely used for pawing the deep.

Why has the whale blowing holes on the head?

Because they may serve for respiration, and for the rejection of water which enters with the food. In consequence of their situation at the top of the head, the water is easily elevated beyond the surface of the sea, while the mouth is usually under water.

Mr Scoresby has ascertained that these blowing-holes emit only a moist vapour, and are huge nostrils. When this vehement breathing or blowing is performed under the surface, much water is thrown out into the air. The sound thus occasioned is the only similitude of a voice emitted by the animal; and, in the case of a violent respiration, it resembles the discharge of a cannon.

Why are the breast-fins of a whale called hands?

Because, instead of being composed of straight spines like those of fishes, they conceal bones and muscles formed very like the fore-legs of land-animals; but so enveloped in dense skin, that the fingers have no separate motion, though the *hand* is flat, very pliant, large and strong, enabling the whale to sustain the young closely compressed to its body, as was remarked by Aristotle.—*Dr Harwood.*

Why do the fins or swimming paws of the whale serve as a helm rather than as oars?

Because, while the whale swims, the fins lie flat on the surface of the water, and are not instrumental in producing its motion, which arises entirely from the tail.—*(Scoresby.)* Such is the spring and vitality of these fins, that, if we may believe De Reste, they continue to move for some time after being separated from the body.

Why is the globe of the eye of the whale nearly spherical, and projecting through the iris?

Because there may be little or no room left for aqueous humour, the whale being so much under water. The aqueous humour being of the same density with the water, would there have no power of refracting rays of light: its place is therefore supplied by an increased sphericity of the lens.—*Notes to Blumenbach.*

Why has the tail of the whale such tremendous power?

Because it consists of two beds of muscles connected with an extensive layer surrounding the body, and enclosed by a thin covering of blubber. It does not rise vertically like that of most fishes, being flat and horizontal, only four or five feet long, but more than twenty feet broad. A single stroke will throw a large boat with all its crew into the air.

Why is the body of the whale surrounded with blubber?

Because it may be enabled to defy the most dreadful extremities of cold, and to preserve a strong animal heat, even under the eternal ice of the Pole.

Why is the palate of the whale covered with baleen? (improperly termed whalebone).

Because it may strain the water, which the whale takes into its large mouth, and retain the small animals on which it subsists. For this purpose the baleen is in the form of sub-triangular plates, with the free edge fringed towards the mouth, the fixed edge attached to the palate, the broad end fixed to the gum, and the apex (or point) to the inside arch. These plates are placed across each other at regular distances. —*Fleming's Philosophy of Zoology.*

Why are the whales seen in the greatest numbers in the olive waters of the Greenland sea?

Because of the incalculable number of medusæ, or animalculæ in these waters, which occupy about a fourth of the Greenland sea, or above 20,000 square miles. The whales cannot derive any direct subsistence from the animalculæ; but these form the food of other minute creatures, which then support others, till at length animals are produced of such size as to afford a morsel for their mighty devourers.

Mr Scoresby estimates that two square miles of these waters contain 23,888,000,000,000,000 animalculæ; and, as this number is beyond the range of human words and conceptions, he illustrates it by observing that 80,000 persons would have been employed since the creation in counting it.

Why is a certain species of whale called razor-back?

Because it has a horny protuberance or fin at the extremity of the back, which part of the body rises into a narrow ridge.

Why is it an error to suppose that the great northern whale feeds on herrings?

Because the structure of its throat and mouth prevent it from swallowing so large a fish; it has no teeth, and its throat is very narrow. Its food is marine worms and insects taken into its mouth with a volume of water, and strained through the fibres of the whalebone fixed in its palate.

The whale that pursues the herrings on the coast of Scotland, is the bottle-nose, an animal of very different anatomy and habits from the great northern whale.—*Notes in various Sciences.*

Why do whalers first attack the suckers or young of the whale?

Because they are under the assurance that the mother will start forth in her own defence.

Why is the white whale more valuable than any other species?

Because it yields spermaceti; which is found in the form of a milk-white oil, in the body, near the blubber, and in cavities on the head. On exposure to the air, it hardens into a semi-transparent kind of tallow. The blubber yields sperm oil: and ambergris is formed in the large intestines when the whale is diseased.

One of this species was taken in 1829, near Whitstable; measuring sixty-two feet in length, and sixty-two feet in height: the oil from which was worth 720*l*, exclusive of the spermaceti.

THE NARWHALE.

Why has the narwhale been called the sea-unicorn?

Because it has been very frequently found with only one tusk. Yet there can be no doubt that it possessed originally two of these, one in either jawbone; and that which is wanting must have been lost by accident, as we can easily suppose. — *Shaw.*

Why was it supposed that the female narwhale had no tusks?

Because the tusks in the female come much later than in the male. Linnæus, and the captains of the Greenland ships fell into this error; but the question has since been decided as above, by Sir E. Home.

THE DOLPHIN.

Why was the dolphin said by the ancients to be attached to man?

Because it is known to accompany ships to considerable distances, as does the shark, but with different motives.

GENERAL ECONOMY.

Why are mammiferous animals the most useful to man?

Because of the difference in their forms, their great docility and their strength. From no other class of animals has man been able to obtain such faithful, serviceable, and valuable assistants; no others are so indispensable to him for his immediate use and support. Whole nations are enabled to supply nearly all their most urgent necessities with a single species of mammiferous animals: — the Greenlanders, with the seal; the Laplanders, Tunguses, &c, with the rein-deer; the Aleutians with the whale.

The various uses of mammiferous animals to man, may be classed as follows: — for riding, draught, husbandry, carrying burdens — the horse, mule, ass, ox, buffalo, rein-deer, elephant, camel, llama, dog. For hunting and watching — the dog. For destroying mice and other vermin — the cat, hedgehog, ant-eater. For food — the flesh of oxen, the sheep, goat, swine, the deer genus, hare, rabbit, besides lard, tallow, blood, milk, butter and cheese. For covering and clothing, — furs, leather, hair, wool. For fuel and burning — tallow, train-oil, spermaceti. For writing, bookbinding, &c, — parchment, leather. For other miscellaneous uses — bristles, hair, antlers, horns, hoofs, ivory, teeth, bone, whalebone, bladders. For glue — guts, tendons, and bones. For strings — guts, (cat gut). Blood for Prussian blue and other colours. Bones and hoofs for ivory black, &c. Fat and marrow for soap. Excrement for manure, fuel, sal ammoniac, &c. Lastly, for medicines — musk, castor, hartshorn, milk, and other articles. — *Blumenbach.*

Why may several animals of this kind be also said to be directly or indirectly injurious to man?

Because many carnivorous animals, particularly of the cat tribe, attack him. These, and many others, as the weasel, marten, polecat, glutton, otter, and whale, destroy serviceable animals, or injure trees, plants, fruit, corn, &c, as the field-mouse, hamster, lemming, deer, hare, beaver, monkey, elephant, rhinoceros, hippopotamus: — or consume our provisions — as the rat, mouse, and bat. No animal of this class appears to be venomous when in a state of health, except, perhaps, the male of the duck-billed animal, (*ornithorincus*) the spur on the hinder leg of which is considered poisonous. — *Blumenbach.*

Why are the skins of animals steeped in the infusions of certain barks for forming leather?

Because the skins being previously prepared by soaking in lime-water, which renders the cuticle and hair easily separable, and afterwards softened by allowing them to enter into a degree of putrefaction, — the action of infusion of oak-bark, or other astringent vegetable matter, is increased until a complete combination has taken place, which is known by the leather being of an uniform brown colour throughout; whereas, in imperfectly tanned leather a white streak is perceptible in the centre. — *Brande.* — Such is the process of tanning.

Why is leather curried with oil while moist?

Because, as the humidity evaporates, the oil penetrates into the pores of the skin, giving it a peculiar suppleness, and making it, to a considerable extent, water-proof. As familiar examples of this and the preceding processes, the thick sole-leather for shoes and boots is *tanned;* the upper leather is *tanned and curried.* — *Aikin.*

Why is it commonly supposed that the flesh of young animals contains more gelatine than that of old ones?

Because the young flesh is merely more soluble and more easily extracted by boiling.

Why, in making animal jelly, is simmering preferable to boiling?

Because, by boiling, the albumen is so firmly coagulated as to envelope the gelatine and protect it from the solvent power of water; whereas, simmering at a temperature from 100 to 120 removes from the muscle the whole of the jelly. — *Brande.*

Why have all animals more or less fat?

Because it may serve as a store of nourishment; being most abundant, when the animal is well furnished with a copious supply of food, and gradually diminishing in quantity as the food becomes scarcer, and disappearing when, from want, a lingering death has been produced. — *Fleming's Zoology.*

Why is it necessary to vary the food of animals?

Because the stomach, like other organs, can be excited to the due performance of its functions only by supplying it with an appropriate stimulus. The same alimentary substance long continued probably loses its stimulating power, and thus, though it abound with nutritive properties, the stomach is incapable of acting upon it.

Why does the blood of different animals vary in smell?

Because the blood of each species contains a principle peculiar to each, which is very volatile, and has an odour resembling the sweat or exhalations of the animal. This principle may be separated by a very simple process;* when it will appear that the blood of the ox has a strong odour of the perspiration of the horse; that of the sheep, a strong odour of wool, impregnated with the perspiration of that animal; that of the dog, the odour of the transpiration of a dog, that of a pig, the disagreeable odour of a piggery; that of a rat, the bad odour belonging to a rat. — *From the French of M. Barual.*

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* Put a few drops of blood into a glass, to which add one-third or half as much concentrated sulphuric acid, and stir the whole together with a tube, when the odoriferous principle will be exhaled.

Why are there great changes in animals on their introduction into a new country?

Because every animal appears, like man, to require time to accustom itself to climate. Thus, in America the hog multiplies very rapidly, and assumes much of the character of the wild boar. Cows did not at first thrive, but in St Domingo, only twenty-seven years after its first discovery, 4,000 in a herd was not uncommon. Cows never thrive nor multiply where salt is wanting either in the plants or in the water. They give less milk in America, and do not give milk at all if the calves be taken from them. Among horses the colts have all the amble as those in Europe have the trot: this is probably an hereditary effect. Bright chestnut is the prevailing colour among the horses. The lambs which are not from *merinos*, at first are covered with wool, and when this is timely shorn it grows again; if the proper time is allowed to elapse, the wool falls off, and is succeeded by short, shining, close hair, like that of the goat in the same climate.

Why is it concluded that no large species of animals remains to be discovered in America?

Because there is no good reason assignable why any such should exist in that country, with which we are acquainted; and in fact, none have been discovered there during the last 150 years.

Why are not the bones uniform in shape?

Because each bone is not, as a mere pillar, intended to bear a perpendicular weight; but, according to its place, bears up against the various forces which are applied to it; and is expanded at the head to give a greater, and consequently a more secure surface for the joint, while its form regulates the direction in which the joint is to move. Archdeacon Paley has, with great propriety, instanced the form of the ends of bones, as proving design in the mechanism of a joint.

Why do certain animals change colour?

Because of the effects of age and climate. Thus, the seal changes colour with his age. Many also become either gray, as the squirrel, or snow-white, as the ermine; with us, merely during the depth of winter, but in the north, throughout the whole. — *Blumenbach.*

Why have ruminating animals a four-fold stomach?

Because its remarkable structure and mechanism may assist the rumination of their food. Thus the food, when first swallowed, and in a half crude state, is received into the immense *first stomach*, as into a storehouse in which it is only a little softened. From it small portions of food are successively taken up by the *second stomach*, which appears merely an appendage to the first, and propelled a second time through the gullet into the mouth. Next, the food, after being again chewed, is carried by a particular groove direct from the gullet into the *third stomach*, without passing through the two first; lastly, it is transmitted to be completely digested in the *fourth*, which approaches most closely to the stomach of other mammiferous animals.

DOMESTICATION.

Why does domestication produce certain variations in animals?

Because of the degrees of slavery and subjection under which those animals are to man. They do not proceed in half-domesticated species. In the cat, for example, a softer or harsher fur, more brilliant or more varied colours, greater or less size — these form the whole extent of the varieties in the species: the skeleton of the cat of Angora differs in no regular or constant circumstances from the wild cat of Europe.

Why are the most remarkable variations produced in the dog?

Because that animal is most completely under the

Because they were furnished by fantastic representations on the ancient monuments of Egypt, in which the parts of different kinds of creatures are strangely combined,—men with the heads of animals, and animals with the heads of men.— *Cuvier.*

Why was the fable of pigmies credited?

Because of the custom of exhibiting in the same sculpture, in bas relief, men of very different heights, of making kings and conquerors gigantic, while their subjects and vassals are represented as only a fourth or fifth part of their size. — *Cuvier.*

Why is the carnivorous bull of Agatharcides a monster of invention?

Because nature has never joined cloven hoofs and horns, as in the bull, with teeth adapted for cutting and devouring animal food.

The mouth of this bull, says the fable, extending from ear to ear, devoured every other animal that came in its way. — *Cuvier.*

Why had the ancients their fables about the graves of giants?

Because they believed giants to have been buried wherever the bones of elephants were dug up.— *Cuvier.*

END OF THE QUADRUPEDS.

KNOWLEDGE FOR THE PEOPLE:

OR THE

PLAIN WHY AND BECAUSE.

PART III.—ORIGINS AND ANTIQUITIES.

ORIGINS AND ANTIQUITIES.

THE CALENDAR.

Why is a table of the year called a calendar?

Because the Romans called the first days of each month *Calends*, from a word which signified *called;* on account of the pontiffs on those days calling the people together, to apprize them of the festivals in the month then beginning.

Why is a calendar of the year called an almanack?

Because of its derivation from the Arabic, *Al manach*, to count. Verstegan makes the word of German origin, *Almonat;* and says that our Saxon ancestors were in the practice of carving the annual courses of the moon upon a small piece of wood, which they called *Almonaught*, (al-moon-heed).

Why are the days of the week called by their present names?

Because our Saxon ancestors dedicated them respectively to their gods: thus, *Sunday* from Sunnan-Dæg, or sun's-day, because it was dedicated to the worship of the sun; *Monday* from Monan-Dæg, to the moon; *Tuesday* from Tuisco, the most ancient god of the Germans; *Wednesday*, a contraction of Wodin's or Odin's day; *Thursday* from Thor's Dæg, or the Thunderer's day, to the worship of Thor, the bravest of the sons of Odin; *Friday*, from Friga, the wife of Odin; and *Saturday*, from Seater-Dæg, from the idol Seater.

Why are two weeks called a fortnight?

Because of its contraction from the Saxon for *fourteen nights*; from the custom of the ancient northern nations to count by nights; thus we say, this day seven, or se'night, for a week.

Why was the eve or day before a solemn feast called a vigil?

Because the primitive Christians were wont to watch, (*vigilare*, Latin) fast and pray in their churches.

Why had the monks a Floral calendar?

Because they had for each day in the year, a flower dedicated to a particular saint, on account of its flowering about the saint's festival.

Why are fairs so often held on church holidays?

Because they originated in an attempt of Gregory the Great to render popular the festival of the patron saints of churches; for which purpose he encouraged the people, on the day of the festival, to erect booths of branches about the church, and to feast and be merry in them with innocence. This custom was introduced into England from the continent, and must have been equally familiar to the Britons and Saxons, being observed among the churches of Asia and Europe in the sixth century, and by those of Western Europe in the seventh. And equally in Asia and Europe, equally on the continent and the islands, these celebrities gave rise to those commercial marts, which we call *fairs*. The people resorted in crowds to the festival, and a considerable provision would be wanted for their entertainment. The prospect of interest invited the little traders of the country to come with their wares; thus, among the many pavilions for hospitality in the neighbourhood of the church, various booths were erected for the sale of commodities. In large towns, surrounded with populous districts, the resort of the people to the wake would be great, and the attendance of traders at the celebrity was numerous; and this resort, and this attendance, constituted a fair.

Basil expressly mentions the numerous appearance of traders at these festivals in Asia, and Gregory notes the same custom to be common in Europe. And, as the festival was observed on a Feria, or holyday, it as naturally assumed to itself, and as naturally communicated to the mart, the appellation of *Feria*, or *fair*. The same among the Saxons, the French, the Germans, the Britons, *Fager*, *Foix*, *Feyer*, *Faire*; the word was derived from the same source in all these nations — the one ecclesiastical language of West Europe at this period. Several of our most ancient fairs appear to have been actually held, and have been actually continued to our own time, on the original church holidays of the places; as that on the festival of St Peter's Church, in Westminster; another on the feast of St Cuthbert, in Durham; and a third on the holiday of St Bartholomew, in London. — *Dr Whitaker.*

Why are public holidays less prejudicial to trade than is generally imagined?

Because, if by an agreement amongst themselves, or by a statute, the shops of tradesmen were shut on one other day besides Sunday in every month, fortnight or week, as much of their wares would be sold as ever; the business that would have been transacted on the new holiday, would be done on one of the remaining days; some ease would be gained, and no custom lost by the whole company. It is no inconvenience to the public that nutmegs and pepper cannot be procured on a Sunday — nor would it be if the same disability was extended to a Wednesday. It would, however, be very inconvenient if there were only one day in the year on which spices could be transferred. — This is the *rationale* of holidays.

In mechanical occupations it is somewhat different. Whilst the saw and the shuttle are still, the gains of the joiner and weaver stop also; but if there be an adequate motive for vigorous exertions, every-one must have observed, that in mechanical arts, although it may not be possible to put the labour of a month into a week, it is very easy to do the work of ten days in nine. A holiday that has been spent in an agreeable and rational manner, has an invigorating effect; and the anticipated holiday is still more animating; besides, unceasing toil is injurious, and an excess of labour, like all other excesses, is mischievous, and destroys the power of labouring. — *Edinburgh Review.*

Why is the first day of the year dedicated to Janus?

Because Janus, being two-faced, is the emblem of retrospect and foresight united.

Why do we make gifts on New Year's day?

Because such was the custom in the time of Romulus and Tatius, when the usual presents were figs and dates covered with leaf gold, and sent by clients to patrons, with a piece of money, which was expended to purchase the statues of deities.

Why is Twelfth Day also called Epiphany?

Because Epiphany signifies manifestation, and this is the day whereon Christ was manifested to the Gentiles.

Why are 'King and Queen' drawn on Twelfth Day?

Because of its origin from a custom among the ancient Greeks and Romans, who, on the festival days of Saturn, about this season of the year, drew lots for kingdoms, and like kings, exercised their temporary authority. — *Brand.* — Mr Fosbroke affirms, that 'the King of Saturnalia was elected by beans, and that from thence came our king and queen on this day.'

Why is the first Monday after Twelfth Day called Plough Monday?

Because it was the first day after Christmas that husbandmen resumed the plough, *Why is a certain inflammatory disease called St Anthony's fire?*

Because when it raged violently, in various parts, in the eleventh century, according to the legend, the intercession of St Anthony was prayed for, and it miraculously ceased.

Why was St Vincent's also called Sunbeam Day?

Because of an old proverb that it bodes good luck if the sunbeams break out during this day. A Latin proverbial line has it, '*Vincenti festo si sol radiat, memor esto;*' thus in English, and extended:—

Remember, on St Vincent's Day
If that the sun his beams display,
Be sure to mark the transient beam
Which through the casement sheds a gleam;
For 'tis a token bright and clear,
Of prosperous weather all the year.

St Vincent, a Spanish martyr, was burnt in 304; and Dr Foster thinks the custom may have been derived from a notion that the sun would not shine continuously on the day whereon the Saint was burnt.

Why was St Paul's also called Prognostic Day?

Because of the ancient superstitious observance of the weather of this day, considered as ominous of the future year, of which the following quotation gives the best account: an old proverb says—

'Clari dies Pauli bona tempora denotat anni.
Si fuerint venti designant poeilia genti.
Si fuerint nebulæ pereunt animalia quæque;
Si nix, si pluvia, designant tempora cara;
Ne credas certè, nam fallit regula sæpe.'

Which has been thus paraphrased:

'If St Paul's Day be fair and cleare,
It doth betide a happy yeare;
But if by chance it then should raine,
It will make deare all kinds of graine;
And if the clouds make dark the skie,
Then neate and fowles this year shall die;
If blustering winds do blow aloft,
Then wars shall trouble the realm full oft.'

Why is Purification Day also called Candlemas?

Because, before mass is said this day, the church *blesses her candles for the whole year*, and makes a procession, with hallowed or blessed candles in the hands of the faithful.— *Old Catholic Tract.*

Why is the festival of St Valentine, or St Valentine's Day, preserved in our Calendar?

Because it was the practice in ancient Rome, during a great part of the month of February, to celebrate the Lupercalia, which were feasts in honour of Pan and Juno, whence the latter deity was named Februata, Februalis, and Februlla. On this occasion, amidst a variety of ceremonies, the names of young women were put into a box, from which they were drawn by the men, as chance directed. The pastors of the early Christian church, who by every possible means endeavoured to eradicate the vestiges of pagan superstitions, and chiefly by some commutations of their forms, substituted, in the present instance, the names of particular saints, instead of those of the women; and as the festival of the Lupercalia had commenced about the middle of February, they appear to have chosen Valentine's Day for celebrating the new feast, because it occurred nearly at the same time.

Brand says, 'I have found unquestionable authority to evince, that the custom of choosing Valentines was a sport practised in the houses of the gentry in England, as early as the year 1476.'

Why were leeks worn by the Welsh, or ancient Britons, on St David's Day.

Because of a signal victory obtained by the Britons under the command of a famous general, known vulgarly by the name of St David; when the Britons wore a leek in their hats, to distinguish their friends from their enemies in the heat of the battle. Other explanations are given; but Mr Brand thinks this is the best solution.

Mr Hone observes, it is probable that leeks were a Druidic symbol, employed in honour of the British *Cendven*, or Ceres, presuming that the Druids were a branch of the Phœnician priesthood. Both were addicted to oak worship; and during the funereal rites of Adonis and Byblos, leeks and onions were exhibited in pots, with other vegetables, and called the gardens of that deity. The leek was worshipped at Ascalon, (whence the modern term of Scallions,) as it was in Egypt; leeks and onions were also deposited in the sacred chests of the mysteries, both of Isis and Ceres, the Cendven of the Druids: leeks are among the Egyptian hieroglyphics, and sometimes a leek is on the head of Osiris; and at other times grasped in an extended hand. *Porrus*, a leek, is derived by Bryant from the Egyptian god Pi-orus, who is the same as the Beal Peor of the Phœnicians, and the Bel or Bellinis of the Druids.

Why is the day before Shrove Tuesday called Collop Monday?

Because it was the last day of flesh-eating before Lent, when our ancestors cut their flesh meat into collops or steaks, for salting or hanging up till Lent was over: hence, in many places, it is still a custom to have eggs and collops, or slices of bacon, at dinner on this day.

Why are pancakes eaten on Shrove Tuesday?

Because they are taken from the heathen *Fornacalia*, celebrated on the 18th of February, in memory of making bread before ovens were invented by the goddess Fornax. — *Fosbrooke.*

Why is the day before Lent called Shrove Tuesday?

Because of its corruption from *Shrive*, an old Saxon word signifying confession. Hence, Shrove Tuesday means Confession Tuesday, on which day all the people in every parish throughout the kingdom, during the Romish times, were obliged to confess their sins, one by one, to their own parish priests, in their own parish churches.

Why was throwing at cocks formerly customary on Shrove Tuesday?

Because the crowing of a cock once prevented our Saxon ancestors from massacring their conquerors, another part of our ancestors, the Danes, on the morning of a Shrove Tuesday, while asleep in their beds.

This is the account generally received, although two lines in an epigram 'On a Cock at Rochester,' by the witty Sir Charles Sedley, imply that the cock suffered this annual barbarity by way of punishment for St Peter's crime, in denying his Lord and Master:—

'Mayst thou be punish'd for St Peter's crime,
And on Shrove Tuesday perish in thy prime.'

A writer in the *Gentleman's Magazine* also says:—'The barbarous practice of throwing at a cock tied to a stake on Shrovetide, I think I have read, has an allusion to the indignities offered by the Jews to the Saviour of the World before his Crucifixion.'—*Ellis's Notes to Brand.*

Why was cock-fighting a popular sport in Greece?

Because of its origin from the Athenians, on the following occasion.--When Themistocles was marching his army against the Persians, he, by the way, espying two cocks fighting, caused his army to halt, and addressed them as follows:—'Behold! these do not fight for their household gods, for the monuments of their ancestors, nor for glory, nor for liberty, nor for the safety of their children, but only because the one will not give way to the other.' This so encouraged the Grecians, that they fought strenuously, and obtained the victory over the Persians; upon which, cock-fighting was, by a particular law, ordered to be annually celebrated by the Athenians.

Cæsar mentions the English cocks in his Commentaries; but the earliest notice of cock-fighting in England, is by Fitzstephen the monk, who died 1191.

Why is Lent so called?

Because of the season wherein it is observed; Lent in the Saxon language signifying Spring, being now used to signify the Spring Fast, which always begins so that it may end at Easter, to remind us of our Saviour's sufferings, which ended at his resurrection.—*Wheatley on the Common Prayer.*

Why is the first day of Lent called Ash Wednesday?

Because, in the Roman Catholic Church, the priest blesses ashes on this day, and puts them on the heads of the people.

Why was leprosy so prevalent in England before the Reformation?

Because of the necessity of eating salt fish and salted meat during a great portion of the year, from the ordinances of the old religion, as well as from the defective state of agriculture.

Why is the shamrock or trefoil the national emblem of Ireland?

Because it is said that when St Patrick landed near Wicklow, to convert the Irish in 433, the pagan inhabitants were ready to stone him; he requested to be heard, and endeavoured to explain God to them as the Trinity in Unity, but they could not understand him; till, plucking a trefoil from the ground, he said 'Is it not as possible for the Father, Son, and Holy Ghost, as for these leaves, to grow upon a single stalk.' Then the Irish were immediately convinced.—*Brand.*

An ingenious naturalist has lately attempted to prove that the original plant was not the white clover which is now employed as the emblem of Ireland. He conceives it should be something familiar to the people, and familiar too when the national feast is celebrated. Now, the white clover is not fully expanded on St Patrick's Day, and wild specimens could hardly be obtained at this season. Besides, it was certainly uncommon in Ireland during its early history, having been introduced into that country in the middle of the seventeenth century, and made common by cultivation. Old authors prove that the *shamrock* was eaten by the Irish; and one who went over to Ireland in the sixteenth century, says it was eaten, and was a *sour* plant. The name, also, of shamrock is common to several trefoils, both in the Irish and Gaelic languages. Now, clover could not have been eaten, and is not sour. *Wood-sorrel* alone is sour, is an early spring plant, is abundant in Ireland, and is a trefoil. The old herbalists call it *shamrog*, and it is sour; while its beauty might entitle it to the distinction of being the national emblem. The substitution of one for the other has been occasioned by cultivation, which made the wood-sorrel less abundant, and the Dutch clover plentiful.—*Abridged from the Philosophical Magazine.*

Why is Lady-Day so called?

Because it is the Annunciation of the Virgin Mary; whose ancient and popular name was 'Our Lady.'

Why are fried peas, eaten in the North on the Sunday, before Palm Sunday, called Carlings?

Because the day was formerly called Carle, or Carle Sunday, as may yet be seen in some old almanacs.

Why were beans applied to religious uses among the Romans?

Because they were thought to belong to the dead. Pliny observes that 'beans contain the souls of the dead;' and Plutarch held them to be of the highest efficacy for invoking the manes. The repast for the dead commonly consisted of beans, lettuces, &c; and in the Lemuria, held to pacify the ghosts of the dead, the Romans threw beans on the fire of the altar, to drive them out of their houses.

Why is Palm Sunday so named?

Because, on that day, as the Ritualists say, the boughs of palm trees used to be carried in procession, in imitation of those which the Jews strewed in the way of Christ when he went up to Jerusalem. Boxwood is still used for palm in Roman Catholic countries; — *(Brand)* — and willow, laurel, yew, and box for decoration, in England.

Why are the blossoms of the willow called palm?

Because, the blossoms coming forth before any leaves appear, and flourishing most before Easter, are gathered to deck houses on *Palm Sunday.*

The ceremony of bearing palms in England was retained till the second year of the reign of Edward VI. Mr Douce says, 'I have somewhere met with a proverbial saying, that he who hath not a palm in his hand on Palm Sunday must have his hand cut off.'

Palm Sunday was also specially observed as a Church festival: in the church-wardens' account of Kingston-upon-Thames, occurs: — 1. Henry VIII. 'For ale upon Palm Sunday, on syngeing of the Passion, 0*l.* 0*s.* 1*d.*'

Why is it customary to make fools on the first of April?

Because, says Mr Douce, 'after all the conjectures which have been formed touching its origin, it is certainly borrowed from the French, and may, I think, be deduced from this simple analogy. The French call them april fish, (*poissons d'Avril*) *i. e.* simpletons, or, in other words, silly mackerel, which suffer themselves to be caught in this month. But, as with us April is not the season of that fish, we have very properly substituted the word Fools.'

Why is a stupid person in the North called a gowk, or a gawkie?'

Because Gauch, in the Teutonic, is rendered *stultus*, fool. — *Brand.*

Why are persons thus imposed upon, in the North of England called 'April gowks'?

Because a gouk, or gowk, is properly a cuckoo, and is used here metaphorically, for a fool. The cuckoo is, indeed, everywhere a name of contempt. In Scotland, upon April-Day, 'they hunt the gowk,' by sending silly people upon fools' errands, from place to place, with a letter, in which is written: —

'On the first day of April,
Hunt the gowk another mile.' — *Brand.*

Why is an absurd errand called 'sleeveless'?

Because, to 'sleave atwo' is an old expression for untwisting or unfolding, and 'less' final being negative, sleeve-less plainly implies that which cannot be untwisted or explained. — *Ellis's Notes to Brand.*

Why is the day before Good Friday called Maunday Thursday?

Because of a custom of the king's distributing alms to a certain number of poor persons at Whitehall, on that day, from *maunds*, or baskets, originally from the Saxon *mand.* — *Nares.*

Part of the ceremony consisted in washing the feet of the poor in the Royal Chapel, which was formerly done by the kings themselves, in imitation of our Saviour's pattern of humility, &c. James II, was the last king who performed this in person; (*Gentleman's Magazine*) it being now the office of the Lord High Almoner.

Why are buns on Good Friday marked with a cross?

Because the cross is a received symbol of the Roman Catholic religion, and commemorates the passion of Christ on this day.

The cross is the most popular emblem of popery that the Reformation has spared in England. The various uses of the cross, devotional as well as secular, deserve notice. 'In the North of England, the country people make with a knife, many little cross marks on their cakes, before they put them into the oven. Persons who cannot write, instead of signing their names, make their marks in the form of a cross. From the cross at the beginning of a horn book, the alphabet is called the Christ Cross Row. The cross used in shop-books, Butler seems to derive from the same origin. The round O of a milk-score is, if I mistake not, marked with a cross for a shilling. Flecknoe says, (1665) that fanatical reformers attached ill luck to a bird flying with its wings across, a ship with its cross-yard sail upon the sea, and profaneness to a tailor sitting cross-legged ; which detestation of the cross-form took its rise from the odium at that time against every thing derived from popery. Among the Irish, when a woman milks her cow, she dips her finger into the milk, with which she crosses the beast, and piously articulates a prayer, saying, 'Mary and our Lord preserve thee till I come again.'—*(Gent. Magaz. 1795.)*

In the West of England, is a vulgar notion, that the straight stripe down the shoulders of the ass, intersected by a long one from the neck to the tail, is a *cross* of honour conferred upon him by Christ, and that before Christ rode upon the ass, that animal was not so distinguished.

Why are these buns so called?

Because of the origin of the term from a species of sacred bread, which used to be offered to the gods, and was called *Boun*. The Greeks, who changed the *nu* final into a *sigma*, expressed it in the nominative Βους, but in the accusative, more truly *Boun*, Βουν. Heyschius speaks of the *boun*, and describes it a kind of cake, with a representation of two horns. Julius Pollux mentions it after the same manner, a sort of cake with horns. Diogenes Laertius, speaking of the same offering, made by Empedocles, describes the chief ingredients of which it is composed. 'He offered one of the sacred Liba, called a *Bouse*, which was made of fine flour and honey.' It is said of Cecrops, that *he* first offered up this sort of sweet-bread. Hence we may judge of the antiquity of the custom, from the times to which Cecrops is referred (1080, B.C.) The prophet Jeremiah takes notice of this kind of offering, when he is speaking of the Jewish women at Pathros in Egypt, and of their base idolatry; in all which their husbands had encouraged them. The women, in their expostulation upon his rebuke, tell him, 'Did we not make thee cakes to worship her?' Jer. xliv. 18, 19. vii. 18. 'Small loaves of bread,' Mr Hutchinson observes, 'peculiar in their form, being long and sharp at both ends, are called buns.' These Mr Bryant derives as above, and concludes: — 'We only retain the name and form of the *Boun*, the sacred uses are no more.' — *Brand.*

Why did the Kings of England formerly hallow rings on Good Friday?

Because the wearers should not be afflicted with the falling sickness; a ring which had long been preserved with great veneration, in Westminister Abbey, being supposed to have great efficacy against the cramp and falling sickness, when touched by those who were afflicted with either of those disorders. This ring is reported to have been brought from Jerusalem.

'Crampe rings' are also mentioned by Lord Berners; and in our times jet rings are by weak persons believed to be singularly efficacious.

Why is Friday superstitiously considered an unlucky day?

Because, probably, of the crucifixion of our Saviour on a Friday — a day of fear, trembling, of darkness, and earthquakes. The fast ordained by the Church contributes to perpetuate these mournful ideas.

The Romans had their *lucky* and *unlucky* days, and on the latter would not undertake any business, for fear it should have a bad conclusion: they considered them as unhappy and of bad omen. The French have also an unlucky or unfortunate day, and this is *Friday*. On this day, they will not undertake any business of importance, for fear of its turning out badly; or a long journey, lest it may abound with distressing accidents; a marriage is seldom contracted on this day, lest it should be unhappy. — Leigh Hunt tells us that 'Lord Byron believed in the *ill-luck* of Fridays, and was seriously disconcerted if any thing was to be done on that frightful day of the week.'

Why is Easter so called?

Because it is derived from the goddess Eastor, worshipped by our Saxon ancestors, with peculiar ceremonies, in April. The anniversary festival in honour of *Christ's resurrection* falling at the same time of the year, occasioned the transfer of the heathen name in this country to the Christain celebration.

Why are churches decorated with flowers and shrubs on Easter Day?

Because the plants are most probably intended as emblems of the resurrection, having just risen from the earth, in which, during the severity of winter, they seem to have been buried. — *Gent. Mag.* 1783.

Why are 'Paste Eggs' given as farings in the northern counties at Easter?

Because the custom is the remains of an ancient superstition of the Roman Church, adopted from the Jews. Thus, in one of their prayers: 'Bless, O Lord, we beseech thee, this thy creature of eggs,' &c.

Eggs were held by the Egyptians as a sacred emblem of the renovation of mankind after the deluge. The Jews adopted it to suit the circumstances of their history, as a type of their departure from the land of Egypt; and it was used in the feast of the passover, as part of the furniture of the table, with the Paschal lamb. The Christians have certainly used it on this day, as retaining the elements of future life, for an emblem of the resurrection. — *Hutchinson's Northumberland.*

Why are these eggs called 'Paste'?

Because they celebrate *Pasche*, or Easter.

Why are tansy puddings and cakes eaten at Easter?

Because they were introduced by the monks, as symbolical of the bitter herbs in use among the Jews at this season; though, at the same time, bacon was always a part of the Easter fare, to denote a contempt of Judaism.

Why are mint and sugar a general sauce for lamb?

Because of its origin from the above custom of eating bitter herbs: the Jews contriving to diminish the bitter flavour of the tansy, by making it into a sauce for their paschal lamb.*

Why was the custom of 'heaving or lifting' formerly very general at Easter?

Because it was intended to represent our Saviour's resurrection. — *Brand.* — The men lift the women on Easter Monday, and the women the men on Tuesday. One or more take hold of each leg, and one or more of each arm, near the body, and lift the person up in a horizontal position, three times. — *Gent. Mag.* 1784.

Why is it erroneous to suppose that the figures on the Biddenden cakes represent the donors of the gift?†

Because the givers were two maidens, named Preston; and the print of the women on the cakes has taken place only within these 50 years, and was intended to represent two poor widows, as the general objects of a charitable benefaction. — *Hasted's Hist. of Kent.*

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* From the Greek *pascha*, also from the Hebrew *peseech*, passover, we have *paschal;* applied to the lamb which formed part of the evening meal, the last of which our Saviour partook, before his death, with his twelve disciples.

† The gift was 20 acres of land at Biddenden, given by persons unknown, the yearly rents of which are to be distributed among the poor of this parish. This is yearly done on Easter Sunday, in the afternoon, in 600 cakes, (each of which has impressed on it the figures of two women), which are given to all such as attend the church; and 270 loaves, weighing 3 1-2 lbs. each, to which latter is added 1 1-2 lb. cheese, are given to the parishioners only, at the same time. The vulgar tradition is that the above figures were twins, joined together in their bodies, and who had lived thus together, till they were between 20 and 30 years of age.

Why is the Sunday after Easter Day called Low Sunday?

Because the ceremonies performed in the ancient church were not of so grand and pompous a nature as the *high* festival of Easter. *Dominica in Albis* is also another title of this Sunday, which took its origin from the chrisoms, or white robes, considered as emblems of purity and innocence, being then laid aside, which had been placed upon those christened on Easter-eve.

Why is St George the patron saint of England?

Because, when Robert, Duke of Normandy, the son of William the Conqueror, was fighting against the Turks, and laying siege to the famous city of Antioch, which was expected to be relieved by the Saracens, St George appeared with an innumerable army, coming down from the hills, all clad in white, with a red cross on his banner, to reinforce the Christians; this so terrified the infidels, that they fled, and left the Christians in possession of the town.—*Butler.*

Why is St George usually painted on horseback, and tilting at a dragon under his feet?

Because the representation is emblematical of his faith and fortitude, by which he conquered the devil, called the dragon in the Apocalypse.—*Butler.*

Why was the Order of the Garter instituted?

Because of the victory obtained over the French at the battle of Cressy; when Edward ordered his garter to be displayed as a signal of battle; to commemorate which, he made a garter the principal ornament of an order, and a symbol of the indissoluble union of the knights. The order is under the patronage or protection of St George, whence he figures in its insignia. Such is the account of Camden, Fern, and others.—The common story of the order being instituted in honour of a garter of the Countess of Salisbury, which she dropped in dancing, and which was picked up by King Edward, has been denounced as fabulous by our best antiquaries.

Why is St George the patron of the army?

Because he was himself a soldier in the army of Dioclesian. — *Butler.*

Why is St Mark usually depicted with a lion couchant, winged, by his side?

Because the lion is emblematical of the nervous solidity of his writings; and the wings, of the more than human powers displayed in their composition.

Why is the Jewish festival of the Passover, or the Pascal Lamb, celebrated on the 25th of April?

Because of the directions given in Exodus, xii, 3 to 20, beginning, 'Speak ye unto all the congregation of Israel, saying, in the tenth day of this month, (Nisan) they shall take to them every man a lamb, without blemish, a male of the first year.' On this occasion, every house was not only ordered to provide a lamb to be killed on the fourteenth day in the evening, but its blood was to be sprinkled on the door-posts, and the lamb eaten by the people in their travelling attire; because it was known, that in consequence of the dreadful plagues, the Egyptians would send them forth in haste. They were also ordered to take of the blood, and strike it on the two side-posts of the door, in order that, when the destroying angel passed through to smite all the first-born of the land of Egypt, seeing this blood, he would *pass over* the children of Israel, so that the plague should not be upon them to destroy them. The feast of the paschal lamb, or passover, was therefore ordered to be kept throughout all generations, by an ordinance, for ever. — *Times' Telescope,* 1815.

Why did the ancient Jews at Jerusalem reserve criminals for execution till the celebration of the most solemn feasts?

Because then, (at the Passover, the Feast of Weeks, and the Feast of Tabernacles) the Jews came up to Jerusalem to sacrifice, and the malefactors were then executed, in order *that all Israel might see and fear.*

Why are parochial perambulations made, and bounds beaten on Ascension Day?

Because they are in imitation of the heathen feast called Terminalia, dedicated to the god Terminus, (Latin for bound) who was considered as the guardian of fields and landmarks, and the keeper up of friendship and peace among men. (*Spelman*, cited by Bourne.) The primitive custom used by Christians on this occasion, was, for the people to accompany the bishop or some of the clergy into the fields, where Litanies were made, and the mercy of God implored, that he would avert the evils of plague and pestilence, that he would send them good weather, and give them in due season the fruits of the earth.—*Brand.*

Shaw, in his history of Staffordshire, says, this ceremony has probably its origin in the Roman offerings of the *primitiæ* (or first fruits). 'The idea was, no doubt, that of returning thanks to God, by whose goodness the face of nature was renovated, and fresh means provided for the sustenance and comfort of His creatures.' The ceremony was sometimes performed at crosses, for in a curious sermon, date 1590, we find that the Catholics had their 'gospelles at superstitious *crosses* deck't like idols;' and Dr Plott says, at Stanlake, Oxon, the minister of the parish, on this occasion, 'reads the gospel at a barrel's head, in the cellar of the Chequer Inn, in that town, where some say there was formerly a hermitage; others, that there was anciently a *cross*, at which they read the gospel in former times; over which, the house, and particularly the cellar, being built, they are forced to continue the custom as above. At Oxford, at this time, the little crosses, cut in the stones of buildings, to denote the division of the parishes, are whitened with chalk.—*Ellis's Notes to Brand.*

Why is Rogation Sunday so called?

Because of the derivation of the term from the

Latin *rogare* to ask; and on the three subsequent days *supplications* were appointed by Mammertus, bishop of Vienna, in the year 1469, to be offered up with fasting, to God, to avert some particular calamities that threatened his diocese.

Why is Rogation Week, in the north of England, called gang week?

Because *gang* there signifies to *go*; and at this time the people make parochial perambulations. Thus, *gang-days* were holidays; and *gadding about* originated in the same custom.

Why is Whit Sunday, or Whiten Sunday, so called?

Because, partly from the glorious light of heaven, which was this day sent down upon the earth, from the Father of lights; but principally, because this day being one of the stated times for baptism in the ancient church, those that were baptised put on *white garments*, as types of that spiritual purity which they received.—*Time's Telescope*, 1814.

Why are certain feasts at Whitsuntide, &c, called ales?

Because much ale was drank then: other etymologies have been attempted; but this is the most natural and most probable. There were bride-ales, clerk-ales, give-ales, lamb-ales, leet-ales, Midsummer-ales, scot-ales, Whitsun-ales, and several more. —*Nares.*

In Poor Robin's almanack for 1676, stool-ball and barley-break, are spoken of as Whitsun sports. In the almanack for the following year, in June, opposite Whitsunday and holidays, we read:—

'At Islington,
A fair they hold;
Where cakes and ale
Are to be sold.

At Highgate and
At Holloway,
The like is kept
Here every day.

At Totnam-court,
And Kentish Town,
And all those places,
Up and down.'

In 'antient tymes,' Whitsun plays were acted at this season. At Chester, these plays were twenty-five in number, and were performed for above three centuries, annually.

Why is 'the Montem' celebrated every third year, on Whit Tuesday, at Eton?

Because, in the opinion of Mr Lysons, it originated in the ceremonial of the Bairn, or Boy-Bishop. Mr Hakewill, (in his *History of Windsor*) asks, 'why may not this custom be supposed to have originated in a procession to perform an annual mass at the altar of some saint, to whom a small chapel might have been dedicated, on the mount called Salt Hill? —a ceremony very common in Catholic countries, as such an altar is a frequent appendage to their towns and populous villages. As for the selling of salt, it may be considered as a natural accompaniment, when its emblematical character, as to its use in the ceremonies of the Roman Catholic Church is contemplated.'

Why is the first of May a festive holiday?

Because its customs hail the return of Spring, and chiefly taken from our conquerors, the Romans. Hence, these festivities are as old as any we have on record. On the 4th of the calends of May, the Romans held their *Floralia*, or festival in honour of *Flora*.

Mr Borlase says: 'May customs are nothing more than a gratulation of the Spring, to testify universal joy at the revival of vegetation.' And Mr Douce observes, 'that there can be no doubt that the Queen of May is the legitimate representative of the goddess Flora, in the Roman festival.'

It was anciently the custom for all ranks of people to go out a maying, early on the first of May. Bourne tells us that in his time, in the villages in the north of England, the juvenile part of both sexes were wont to rise a little after midnight on the morning of that day, and walk to some neighbouring wood, accompanied with music and the blowing of horns, where they broke down branches from the trees, and adorned them with nosegays and crowns of flowers. This done, they returned homewards with their booty, about the time of sunrise, and made their doors and windows triumph in the flowery spoil. 'There was a time when this custom was observed by noble and royal personages, as well as the vulgar.' --*Brand.*

The supposed cosmetic virtues of may-dew, when gathered before sun-rise, are pretty generally remembered in the country; and a writer in the *Quarterly Review* playfully observes, 'it was probably an allegory, by which some village Zadig attempted to induce the maidens to attend to the wholesome observances of early rising and exercise.'

Mr Ellis occupies upwards of fifty quarto pages with May-day customs, few only of which we can find room to notice. In an old pamphlet quoted by him, we find the May-pole, mentioned in a new and curious light. We gather from the writer, that our ancestors held an anniversary assembly on May-day, and that the column of May, whence our May-pole, was the great standard of justice, in the Ey-commons or fields. Here it was that the people, if they saw cause, deposed or punished their governors, their barons, and their kings. The judges' bough or wand (at this time discontinued, and only faintly represented by a trifling nosegay) and the staff or rod of authority in the civil and in the military, (for it was the mace of power and the truncheon of the field officer) are both derived from hence. A mayor, he says, received his name from this May, in the sense of lawful power; the crown, a mark of disparity, was also taken from the May, being representative of the garland or crown, which, when hung on the top of the May or pole, was the great signal for convening the people; the arches of it, which spring from the circlet and meet together at the mound, or round ball, being necessarily so formed, to suspend it to the top of the pole. He also tells of a mock-battle custom between youth, the one party in winter, and the other in spring livery; when spring was sure to gain the victory.

The puritans fought a stubborn battle with the may-poles, 'those heathenish vanities of superstition and wickedness,' and the poles never held up their heads again. The last upon record, was that in May Fair, which was 'begged' by Sir Isaac Newton, as a stand for his telescope.

Superstition was busy on this day: and among other omens attached to it, was the ill luck of being married in the month of May,—as old as Ovid. Scot, in his 'Discovery of Witchcraft,' also tells us of an old superstition: 'To be delivered from witches, they hang in their entries (among other things) May-thorn, otherwise white-thorn, gathered on May-day.' The only relics of May-customs in our times, are the May-day milking-pail, the *saturnalia* of chimney-sweeps; and the occasional decoration of horses. Of the milk-pail, Strutt observes: 'The mayings are in some part yet kept up by the milk-maids at London, who go about the streets, with their garlands and music, dancing; but this tracing is a very imperfect shadow of the original sports; for, may-poles were set up in the streets, with various marshal shows, morris-dancing, and other devices, with which, and revelling, and good cheer, the day passed away. At night they rejoiced, and lighted up their fires.'

With the *poetry* of this festival the reader is probably more familiar, from Shakspeare, Milton, and Herrick, to 'May-day with the Muses,' by Bloomfield. Still more recent is, from the devoutly-elegant pen of the late Bishop Heber, the following

CAROL FOR MAY-DAY.

Queen of fresh flowers,
  Whom vernal stars obey,
Bring thy warm showers,
  Bring thy genial ray.
In Nature's greenest livery drest,
Descend on earth's expectant breast,
To earth and heaven a welcome guest,
  Thou merry month of May.

Mark how we meet thee
At dawn of dewy day!
Hark how we greet thee
With our roundelay!
While all the goodly things that be
In earth, and air, and ample sea,
Are waking up to welcome thee,
Thou merry month of May.

Flocks on the mountains,
And birds on their spray,
Tree, turf and fountains
All hold holiday:
And love, the life of living things,
Love waves his torch, love claps his wings,
And loud and wide thy praises sings,
Thou merry month of May.

Why is the first of May, in Scotland, called Baltein day?

Because of a rural sacrifice held there, called the Baltein or Fire of Baal. Baal, or Ball, is the only word in Gaelic for a globe. This festival was, probably, in honour of the sun, whose return, in his apparent annual course, was celebrated, on account of his having such a visible influence, by his genial warmth, on the productions of the earth. That the Caledonians paid a superstitious respect to the sun, is evident, not only by the sacrifice at Baltein, but upon many other occasions. When a Highlander goes to bathe, or to drink water out of a consecrated fountain, he must always approach by going round the place, *from East to West, on the South side*, in imitation of the apparent diurnal motion of the sun. This is called, in Gaelic, going round the right or the lucky way. And if a person's meat or drink affect the windpipe, or come against his breath, they instantly cry out *deisheal!* which is an ejaculation, praying that it may go the right way.—*Ellis.*

Why are Morris-dancers so called?

Because they originated from the Moors; *Morisco,* in Spanish, signifying a Moor. In the dance there were usually five men, and a boy dressed in a girl's habit, whom they called the Maid Marrion, or, perhaps, Morion, from the Italian Morione, a head-piece, because her head was wont to be gaily trimmed up. Common people call it a Morris-dance. — *Blount.*

Dr Johnson says: 'The Morris-dance, in which bells are jingled, and staves or swords clashed, was learned by the Moors, and was probably a kind of Pyrrhic or military dance.' Morris-dances, as well as May-poles, have been, in the worst spirit of party zeal, anathematized as relics of paganism.

Why does the old proverb say —

'Barnaby bright,
The longest day, and the shortest night?'

Because, Barnaby or Barnabas-day, is the summer-solstice or sun-steed, when the sun seems to stand, and begins to go back, it being the longest day in the year, about the eleventh or twelfth of June: it is taken for the whole time, when the days appear not, for fourteen days together, either to lengthen or shorten. — *Festa Anglo Romana.*

Why were bonfires formerly lit on Midsummer-eve?

Because the bon-fire was a *feu de joie*, kindled at the very moment the year began; for, the first of all years, and the most ancient that we know of, began at this month of June. Thence, the very name of this month, junior, the youngest, which is renewed; while that of the preceding one is May, major, the antient. Thus, the one was the month of young people, while the other belonged to old men. These *feux de joie* were accompanied with vows and sacrifices for the prosperity of the people and the fruits of the earth. They danced round the fire, and leaped over it: each on departing took away a fire-brand, great or small, and the remains were scattered to the wind, which, at the same time that it dispersed the ashes, was thought to expel evil. When, after a long train of years, the year ceased to commence at this solstice, still the custom of making fires at this time, was continued by force of habit, and of those superstitious ideas that are annexed to it.—*Gebelin*, cited by Brand, who thinks the leaping over the fires was as much a religious act as making them. Ovid mentions leaping over the fires at the Palilia, feasts in May, to drive away wolves from the folds, and distempers from the cattle. Borlase reckons them 'among the relics of the Druid superstitious fires.'

Why was it customary to watch at the church-porch at Midsummer-eve?

Because it was believed, that persons so watching, would, at midnight, see the spirits of the persons of the parish who should die that year come and knock at the church-door, in the order and succession in which they were to die.—*Grose.*

The Connoisseur, No. 56, says, on this custom: 'I am sure my own sister Hetty, who died just before Christmas, stood in the church porch last Midsummer-eve, to see all that were to die in our parish, and she saw her own apparition.'—This superstition was, however, more generally practised on the eve of St Mark.

Gathering roses, and sowing hemp-seed for love divinations, were also Midsummer-eve customs. Scot also tells us: 'against witches hang boughs, hallowed on Midsummer-Day, at the stall where the cattle stand.'

Why is it said, that 'if it rains on St Swithin's-Day, it will rain forty days following?'

Because, in the year 865, Swithin, Bishop of Winchester dying, was canonized by the then Pope. He was, at his own request, buried in the church-yard; but the monks thinking it disgraceful for the saint to lie in open ground, resolved to remove his body into the choir, which was to have been done with solemn procession, on July 15. It rained, however, so violently on that day, and for forty days succeeding, as had hardly ever been known, which made them set aside their design, and instead, erect a chapel over his grave.

Why were little knives given at Croyland Abbey, to all comers, on St Bartholomew's Day?

Because of their allusion to the knife wherewith St Bartholomew was flead. — *Gough.*

Why were the rood and cross synonomous?

Because the rood, when perfectly made, and with all the appurtenances, had not only the image of our Saviour extended upon it, but the figures of the Virgin Mary and St John, one on each side: in allusion to John xix, 26. 'Christ on the cross, saw his mother, and the disciple whom he loved, standing by.' — *Fuller.*

Such was the rood usually placed over the screen which divided the nave from the chancel of the churches. To our ancestors, we are told, is thus conveyed a full type of the Christian church: the nave representing the church militant, and the chancel the church triumphant, denoting, that all who would go from the one to the other, must pass under the rood, that is, carry the cross, and suffer affliction. Many of our rood-lofts were not taken down till late in the reign of Queen Elizabeth. — *Ellis.*

Why are sticks chopped and hob-nails counted by the City of London authorities, in the Court of Exchequer, on Michaelmas Day?

Because the tenants of a manor in Shropshire are directed then to come forth to do their suit and service; on which the senior alderman below the chair steps forward, and chops a single stick, in token of its having been customary for the tenants of that manor to supply their lord with fuel. The owners of a forge in the parish of St Clement, (which formerly belonged to the city, and stood in the high road from the Temple to Westminster, but now no longer exists) are then called forth to do their suit and service; when an officer of the court, in the presence of the senior alderman, produces six horse-shoes, and six hobnails, which he counts over in form before the Cursitor-baron, who, on this particular occasion, is the immediate representative of his sovereign. — *Gentleman's Magazine.*

Why is it customary to eat goose on Michaelmas Day?

Because of its forming part of the royal dinner when the news was brought to Queen Elizabeth of the defeat of the Spanish Armada; when her chivalrous Majesty commanded, that the dish (a goose) then before her, might be served up on every 29th of September, to commemorate the above glorious event.

Mr Douce saw the above reason 'somewhere;' but Mr Brand thinks this rather to be a stronger proof that the custom prevailed even at court in Queen Elizabeth's time. Beckwith, in his edition of Blount's Tenures, says, 'Probably no other reason can be given for this custom, but that Michaelmas Day was a great festival, and geese at that time most plentiful. In Denmark, where the harvest is later, every family has a roasted goose for supper on St Martin's Eve.' — Bringing a goose 'fit for the Lord's dinner' on this day, appears to have been customary even in the time of Edward IV; and in Gascoigne is the following: —

'And when the tenauntes come to pay their quarter's rent,
They bring some fowle at Midsummer, a dish of fish at Lent;
At Christmasse a capon, at *Michaelmas* a *goose*,
And somewhat else at New yere's tide, *for feare their lease flie loose.*'

The practice of eating goose on Michaelmas Day, does not appear to prevail in any part of France. Upon St Martin's Day they eat turkey at Paris. They likewise eat geese upon St Martin's Day, Twelfth Day, and Shrove Tuesday, at Paris. — *Ellis's Notes to Brand.*

Why was it said that 'if you eat goose on Michaelmas Day, you will never want money all the year round?'

Because, as we read in the *British Apollo*, before quoted —

'The custom came up from the tenants presenting
Their landlords with geese, to incline their relenting
On following payments.'

Again : —

' For doubtless 'twas at first designed
To make the people *seasons* mind,
That so they might apply their care
To all those things which needful were ;
And by a good industrious hand,
Know when and how t' improve their land.'

Why is the first of August called Lammas?

Because it is a corruption of *Loaf-Mass*, it being customary for the Saxons to offer an oblation of new bread on this day, as the first fruits of the harvest; and from its being observed with bread of new wheat, it was an usage in some places for the tenants to be bound to bring in wheat of that year to their lord, on or before August 1.

Mass, it may be added, was a general word for festival, as the festivals of Christ-mass, Candle-mass, &c.

Why was it formerly thought in England, that every man had his guardian angel from the cradle to the grave?

Because the Egyptians believed that every man had three angels attending him ; the Pythagoreans that every man had two ; the Romans, that there was a good and evil genius. Sheridan, in his notes to Persius, says, 'every man was supposed by the ancients at his birth to have two genii, as messengers between the gods and him. They were supposed to be private monitors, who, by their insinuations, disposed us to good or evil actions. They were also supposed to be not only reporters of our crimes in this life, but registers of them against our trial in the next, whence they had the name of *Manes* given them.'

Why has it been asked whether every man has a good and bad angel attending him?

Because the ministration of angels is certain, but the matter is how is the knot to be untied. 'Twas generally believed by the ancient philosophers, that not only kingdoms had their tutelary guardians, but that every person had his particular genius, or good angel, to protect and admonish him by dreams, visions, &c. We read that Origen, Hierome, Plato, and Empedocles, in Plutarch, were of this opinion; and the Jews themselves, as appears by that instance of Peter's deliverance out of prison; they believed it could not be Peter, but his angel. But for the particular attendance of bad angels, we believe it not, and we must deny it, till it finds better proof than conjectures. — *Athenian Oracle.*

Why do weak persons pay attention to particular dreams?

Because, probably, of this antient notion of good and evil genii attending each person: the vulgar, it should seem, thinking dreams the means these invisible attendants make use of, to inform their wards of any imminent danger. — *Brand.*

Why is St Luke the patron of painters?

Because he is said to have been veryskilful in painting, especially in his portraits of Jesus Christ. The usual oath of King William (Rufus) was by the face of Christ depicted by St Luke.

Why is St Crispin the patron-saint of shoemakers?

Because Crispin, and his brother Crispianus, having travelled to Soissons, in France, in the year 303, to make converts to Christianity, they maintained themselves by *shoemaking;* whence they became regarded as the patrons of the 'gentle craft.' They were both born at Rome.

Why is the 1st of November the festival of all Saints?

Because it serves to commemorate all those saints and martyrs to whom no separate day has been assigned.

Why is the 2nd of November the festival of all Souls?

Because of its institution in the 9th century, by Odilon, Abbot of Cluny, to make intercession for the souls supposed to be detained in purgatory. The tortured soul once released, it is said, cannot again be doomed to suffering. Various tenures were held by services to be performed on this day.

Why is All-Hallow-Even in the north, vulgarly called Nutcrack Night?

Because it is a festival in which nuts and apples compose the entertainment; when the nuts are thrown into the fire, or cracked, to propitiate omens touching matrimony: if the nuts lie still and burn together, they prognosticate a happy marriage or a hopeful love; if, on the contrary, they bounce and fly asunder, the sign is unpropitious. — *Hutchinson.*

Burns, in a note to his poetical description of Hallow-e'en, says: 'Burning the nuts is a favourite charm: they name the lad and lass to each particular nut as they lay them in the fire; and, accordingly as they burn quietly together, or start from beside one another, the course and issue of the courtship will be.' A similar custom, according to Mr Ellis, prevails in Ireland. The superstitious notions in cracking nuts generally, is well known. Bonfires, ringing of bells, and feasting, are also customary on All-hallow-e'en.

Why was it customary also to sow hemp on all hallow-e'en?

Because it was believed that by looking over the left shoulder, the sower might see his or her true love. The ceremony is thus described by Burns: 'Steal out unperceived, and sow a handful of hemp-seed, harrowing it with anything you can conveniently draw after you. Repeat, now and then, "Hemp seed, I saw thee, hemp seed, I saw thee; and him (or her) that is to be my true love, come after me and pou thee." Look over your left shoulder, and you will see the appearance of the person invoked, in the attitude of pulling hemp. Some traditions say "Come after me and show thee," that is, show thyself, in which case it simply appears. Others omit the harrowing, and say, "Come after me, and harrow thee."' Gay describes a similar rite at Midsummer. Burns likewise describes several other customs on this festival, as divination by pulling stalks of corn; by blue clue; eating the apple at the glass; running round the stack three times, &c.

Why is the seventeenth of November kept as a holiday?

Because it is the anniversary of the accession of Queen Elizabeth. A writer in the time of George I, observes: 'This might well be a great promoter of the tallow chandlers' welfare; *for marvellous illuminations will be set forth in every window*, as emblems of her shining virtue; *and will be stuck in clay*, to put the world in mind that grace, wisdom, beauty, and virginity, were unable to preserve the best of women from mortality.'

Why is St Cecilia regarded as the patroness of music?

Because tradition relates that she was so skilful a musician, that an angel who visited her was drawn from the mansions of the blessed by the charms of her melody; to which circumstance Dryden alludes in the conclusion of his celebrated Ode to Cecilia.

Why is an anchor the device of St Clement?

Because his legend relates that he was cast into the sea with an *anchor* about his neck; and that on the first anniversary of his death, the sea retired from the place where he suffered, though three miles from the shore, and discovered a superb temple of the finest marble, which contained a monument to the saint. The sea withdrew in this way for several years, for seven days in succession. In allusion to this circumstance, the device of an anchor may be seen in various parts of the Church of St Clement Danes, London, and on the boundary marks of the parish.

Why is a certain firework called the Catherine wheel?

Because of its resemblance to the instrument of torture by which St Catherine, according to the legend, suffered martyrdom. This was by four cutting wheels, in which were saws of iron, sharp nails, and sharp knives; the wheels turned one against another, and thus the saws, knives, and nails met. She was so tied to one of the wheels, that the other, being turned the contrary way, her body might be torn in various places with the sharp instruments — hence, St Catherine is usually represented with a large wheel by her side.

Why is old Martinmas still noticed in our almanacks on Nov. 23?

Because it was one of the ancient quarterly periods of the year, at which even to this time, a few rents become payable. — *Brady's Clavis Calendaria,* 1812.

Why is St Andrew's cross part of the insignia of the Scottish order of the Thistle?

Because Andrew is the tutelar Saint of Scotland, and he suffered martyrdom on a cross in the form of an X. The Scotch likewise assert that his remains were deposited in Fifeshire, in the year 368.

Why is St Nicholas the chosen patron of schoolboys?

Because of the following circumstance, related in a story in an Italian Life of Nicholas, 3rd edition, 4to. Naples, 1645.

'The fame of Nicholas's virtues was so great, that an Asiatic gentleman, on sending his two sons to Athens for education, ordered them to call on the Bishop for his Benediction; but they, getting to Mira late in the day, thought proper to defer their visit till the morrow, and took up their lodgings at an inn; where the landlord, to secure their baggage and effects to himself, murdered them in their sleep, and then cut them into pieces, salting them, and putting them into a pickling tub with some pork, which was there already, meaning to sell the whole as such. The Bishop, however, having had a vision of this impious transaction, immediately resorted to the inn, and calling the host to him, reproached him for his horrid villainy. The man, perceiving that he was discovered, confessed the crime, and entreated the

Bishop to intercede on his behalf to the Almighty for his pardon; who, being moved with compassion at his contrite behaviour, confession, and thorough repentance, besought Almighty God not only to pardon the murtherer, but also, for the glory of his name, to restore life to the poor innocents who had been so inhumanly put to death. The saint had hardly finished his prayer, when the mangled and detached pieces of the two youths were by divine power reunited; and perceiving themselves alive, threw themselves at the feet of the holy man, to kiss and embrace them. But the Bishop, not suffering their humiliation, raised them up, and exhorted them to return thanks to God alone for this mark of his mercy, and gave them good advice for the future conduct of their lives; and then, giving them his blessing, he sent them with great joy to prosecute their studies at Athens. This, I suppose, sufficiently explains the naked children and tub, "the well-known emblems of St Nicholas."'

The election of the Boy-Bishop on St Nicholas's Day, in almost every parish in England, has been traced to the thirteenth century. He wore the episcopal vestments, with mitre and crosier, and, strange as it may appear, he took possession of the church, and, except mass, performed all the ceremonies and offices.

The Boy-Bishop walked about in procession with his fellows; in 1542 this show was abrogated. The practice of electing a Boy-Bishop appears also to have subsisted in common grammar-schools. Mr Warton thinks that the Montem at Eton *(see p. 23.)* 'originated from the ancient and popular practice of theatrical processions in collegiate bodies;' but Mr Brand shows that it is only a corruption of the ceremony of the Boy-Bishop and his companions; who being, by Henry the Eighth's edict, prevented from mimicking any longer their religious superiors, gave a new face to the festivity, and began their present *play at soldiers.* This shows how early our youth began to imitate the martial manners of their elders in these sports, for it appears from the Close Rolls of Edward I, that a precept was issued to the Sheriff of Oxford, in 1305, from the king, 'to prohibit tournaments being intermixed with the sports of the scholars, on St Nicholas' Day.'

Why is St Nicholas the patron of Parish Clerks?

Because scholars were anciently denominated *clerks.* In Shakspeare's first part of Henry IV, Act 2, sc. i, *robbers* are called 'St Nicholas's *clerks.* They were also called St Nicholas's knights. St Nicholas being the patron of scholars, and Nicholas, or Old Nick, a cant name for the devil, this equivocal patronage may possibly be solved; or perhaps it may be much better accounted for by the story of St Nicholas and some thieves, whom he compelled to restore some stolen goods, and brought 'to the way of trouth;' for which the curious reader is referred to the Golden Legend.—*Ellis's Notes to Brand.*

Sir Walter Scott, it may be added, attributes the origin of Old Nick, as a cant name for Satan, to Nixas, or Nicksa, a river or ocean god, worshipped on the shores of the Baltic. Hence, the British sailor, who fears nothing else, confesses his terror for this terrible being, and believes him the author of almost all the various calamities to which the precarious life of a seaman is so constantly exposed. —*Letters on Demonology and Witchcraft.*

Why was St Nicholas considered the patron of sailors?

Because of the two boys in a tub (part of the saint's emblems) being mistaken for their sailing in a ship. Armstrong, speaking of Ciudadella, says: 'Near the entrance of the harbour stands a chapel, dedicated to St Nicholas, to which the sailors resort that have suffered shipwreck, to return thanks for their preservation and to hang up votive pictures, representing the dangers they have escaped, in gratitude to the saint for the protection he vouchsafed them, and in accomplishment of the vows they made during the height of the storm. This custom originated with the Greeks and Romans. Bion, the philosopher, was shown several of these votive pictures, hung up in a temple of Neptune, near the sea-side: Horace also alludes to them.

Why is Dec. 13, in the Ephemeris of Nature, called Ruminudia, or Bare-bough-day?

Because the leaves by this time are all fallen, and the branches bare.

Why was it formerly supposed that cocks crowed all Christmas-eve?

Because the weather is then usually cloudy and dark, (whence 'the dark days before Christmas,') and cocks, during such weather, often crow nearly all day and all night. Shakspeare, alludes to this superstition in Hamlet.—

> — Some say that even 'gainst that hallow'd season,
> At which our Saviour's birth is celebrated,
> The Bird of Dawning croweth all night long.
> The nights are wholesome, and no mildew falls,
> No planet strikes, nor spirits walk abroad;
> No fairy takes, nor witch hath power to charm,
> So gracious and so hallowed is the time.

The ancient Christians divided the night into four watches, called, the evening, midnight, and two morning cock-crowings. Their connexion with the belief in walking spirits, will be remembered:

> The cock crows, and the morn grows on,
> When 'tis decreed I must be gone.—*Butler.*

> ————————————The tale
> Of horrid apparition, tall and ghastly,
> That walks at dead of night, or takes his stand
> O'er some new-open'd grave: and, strange to tell,
> Evanishes at crowing of the cock.—*Blair.*

Who can ever forget the night-watches proclaimed by the cock in that scene in Comus, where the two brothers in search of their sister, are benighted in a forest:—

> ————————Might we but hear
> The folded flocks, penned in their wattled cotes,
> Or sound of pastoral reed with oaten stops,
> Or whistle from the lodge, or village cock
> Count the night-watches to his feathery dames,
> 'Twould be some solace yet, some little cheering,
> In this close dungeon of innumerous boughs.

Dr Forster observes: 'There is this remarkable circumstance about the crowing of cocks,—they seem to keep night-watches, or to have general crowing matches at certain periods; as, soon after twelve, at two, and again at day-break. These are the Alectrephones mentioned by St John. To us, these cock-crowings do not appear quite so regular in their times of occurrence, though they actually observe certain periods, when not interrupted by the changes of the weather, which generally produce a great deal of crowing. Indeed, the song of all birds is much influenced by the state of the air.' Dr F. also mentions, 'that cocks began to crow during the darkness of the eclipse of the sun, Sept. 4, 1820; and it seems that *crepusculum*, (or twilight) is the sort of light in which they crow most.'

Why was Christmas-eve called by the Anglo-Saxons Myd-wyntres maesse-daeg?

Because Christmas itself was called *Mid-winter*, and *Mid-wyntres maesse-daeg*, as they gave the name of Midsummer to St John's Day.

It was once believed that if we were to go into a cow-house, at twelve o'clock at night, all the cattle would be found kneeling. Many also firmly believed that bees sung in their hives on Christmas eve, to welcome the approaching day.

Why is the evening before Christmas-day celebrated?

Because Christmas-day, in the primitive Church, was always observed as the Sabbath Day, and, like it, preceded by an eve, or vigil.—*Brand.*

Why is Christmas-day so called?

Because of its derivation from *Christi Missa*, the mass of Christ; and thence the Roman Catholic Liturgy is termed, their *Missal*, or *Massbook*. About the year 500, the observation of this day became general in the Catholic Church.

Why was the word Yule formerly used to signify Christmas?

Because of its derivation from the word *ol*, ale, which was much used in the festivities and merry meetings of this period; and the *I* in *Iol*, *icol*, Cimb. as the *ze* and *zi* in *zehol*, *zeol*, *ziol*, Sax. are premised only as intensives, to add a little to the signification, and make it more emphatical. *Ol*, or *Ale*, did not only signify the liquor then made use of, but gave denomination to the greatest festivals (*see page* 22) as that of *zehol* or *Yule*, at Midwinter; and as is yet plainly to be discovered in that custom of the Whitsun ale at the other great festival.

Why are certain initials affixed to crucifixes?

Because of their signifying the titular tributes paid to the Saviour of the world. Thus, I. N. R. I. are universally agreed to be the initials of the Latin words *Jesus Nazarenus Rex Judæorum*, i. e. Jesus of Nazareth, King of the Jews, a title which Pilate wrote and affixed to the cross.—See John, ch. xix. The initials I. H. C. appended to other crosses, are said to imply, *Jesus Humanitatis Consolator*,—Jesus the Consoler of Mankind; and the I. H. S. imply, *Jesus Hominum Salvator*, Jesus the Saviour of Men. The first mentioned initials, are, however, found on the most ancient crosses.

Why is a certain song called a carol?

Because of its derivation from *cantare*, to sing, and *rola*, an interjection of joy.—*Bourne*.

Bishop Taylor observes that the 'Gloria in excelsis,' the well-known hymn sung by the angels to the shepherds at our Lord's nativity, was the earliest ✓ Christmas carol. Bourne cites Durand to prove that in the earlier ages of the Churches, the Bishops were accustomed on Christmas-day, to sing carols among their clergy. Fosbroke says: 'It was usual, in ancient feasts, to single out a person, and place him in the midst, to sing a song to God.' And Mr Davies Gilbert states, that till lately, in the West of England, on Christmas-eve about seven or eight o'clock in the evening, festivities were commenced, and 'the singing of carols begun, and continued late into the night. On Christmas-day, these carols took the place of psalms in all the churches, especially at afternoon service, the whole congregation joining, and at the end it was usual for the parish-clerk to declare, in a loud voice, his wishes for a merry Christmas and a happy new year to all the parishioners.'

Mr Hone observes in his work on 'Ancient Mysteries,' that 'the custom of singing carols at Christmas, prevails in Ireland to the present time. In Scotland, where no church fasts have been kept since the days of John Knox, the custom is unknown. In Wales it is still preserved to a greater extent, perhaps, than in England: at a former period, the Welsh had carols adapted to most of the ecclesiastical festivals, and the four seasons of the year, but, at this time, they are limited to that of Christmas. After the turn of midnight, on Christmas-eve, service is performed in the churches, followed by singing carols to the harp. Whilst the Christmas holidays continue, they are sung in like manner in the houses; and there are carols especially adapted to be sung at the doors of the houses by visiters before they enter. *Lfyr Carolan*, or the Book of Carols, contains sixty-six for Christmas, and five summer carols. *Blodengerdd Cymrii*, or the Anthology of Wales, contains forty-eight Christmas carols, nine summer carols, three May carols, one winter carol, one nightingale carol, and a carol to Cupid. On the Continent, the custom of carolling at Christmas is almost universal. During the last days of Advent, Calabrian minstrels enter Rome, and are to be seen in every street saluting the shrines of the Virgin mother with their wild music, under the traditional notion of charming her labour pains on the approaching Christmas.'

Why do the Christmas carols of the present day differ from the carols of earlier times?

Because the original carols were festal chansons for enlivening the merriment of the Christmas celebrity; and not such religious songs as are current at this day, with the common people, under the same title, and which were substituted by those enemies of innocent and useful mirth, the Puritans.

Dr Johnson, in a note on Hamlet, tells us, that the pious chansons, a kind of Christmas carol, containing some Scripture History, thrown into loose rhymes, were sung about the streets by the common people, when they went at that season to beg alms. —*Brand.*

Why is laurel used with other evergreens to deck houses at Christmas?

Because of its use among the ancient Romans as the emblem of peace, joy, and victory. In the Christian sense, it may be applied to the victory gained over the powers of darkness by the coming of Christ.—*Bourne.*

Why is the misletoe so called?

Because its seeds are said to be dropped by the misle-thrush, which feeds on its berries.

Why was the misletoe held sacred by the Druids?

Because they had an extraordinary reverence for the number *three*, and not only the berries, but the leaves of the misletoe grow in clusters of three united on one stalk. Its growing upon the oak, their sacred tree, was doubtless another cause of its veneration.

When the end of the year approached, the Druids marched with great solemnity to gather the misletoe of the oak, in order to present it to Jupiter, inviting all the world to assist them at this ceremony, with these words: 'The new year is at hand, gather the misletoe.'—*Borlase.*

We read of a celebrated oak at Norwood, near London, which bore misletoe, 'which some people cut for the gain of selling it to the apothecaries of London, leaving a branch of it to sprout out; but they proved unfortunate after it, for one of them fell lame, and others lost an eye. At length, in the year 1678, a certain man, notwithstanding he was warned against it, upon the account of what the others had suffered, adventured to cut the tree down, and he soon after broke his leg.'— *Camden.*

Mr Brand, however, thinks that misletoe was never put up in churches but by mistake or ignorance of the sextons; it being a heathenish and profane plant, and therefore assigned to the kitchen. Mr Brand made many diligent enquiries after the truth of this point. He learnt at Bath that it never came into churches there. An old sexton at Teddington told him that misletoe was once put up in the church there, but was by the clergyman immediately ordered to be taken away.

Why is holly so called?

Because of its supposed corruption from *holy*, as Dr Turner, our earliest writer on plants, calls it holy and holy-tree; which appellation was given it, most probably, from its being used in holy places. It has a great variety of names in Germany; amongst which is *Christdorn;* in Danish it is also called *Christhorn;* and in Swedish *Christtorn*, amongst other appellations: from whence it appears that it is considered a holy plant by certain classes in those countries.—*Phillips's Sylva Florifera.*

Why is rosemary so called?

Because its botanical name, *rosmarinus*, is derived from *ros*, dew, and *marinus*, alluding to its situation on the sea-shore. At Christmas, the boar's head was stuffed with rosemary.

Why was the boar's head formerly a prime dish at Christmas?

Because fresh meats were then seldom eaten, and brawn was considered a great delicacy. Holinshed says, that 'in the year 1170, upon the day of the young prince's coronation, King Henry I, served his sonne at table as server, bringing up the boar's head with trumpets before it, according to the manner.' For this ceremony there was a special carol. Dugdale also tells us, that 'at the inns of court, during Christmas, the usual dish at the first course at dinner, was a large *bore's head*, upon a silver platter, with minstralsaye.' In one of the carols we read that the boar's head is 'the rarest dish in all the londe, and that it has been provided in honour of the king of bliss.'

Why were mince-pies originally made in a long shape at Christmas?

Because they might imitate the cratch, that is, rack or manger wherein Christ was laid.—*Selden.*

Why was one of the ancient Christmas characters called a Lord of Misrule?

Because of the origin of the office from an Imperator or master of the plays exhibited at the Colleges of Oxford and Cambridge: or, it may be more directly explained by the election of mock monarchs for the season, among public societies during Christmas. In Polydore Vergil, we find such brief authorities mentioned as '*Christemass Lordes*,' to whom all the household and family, with the master himself, must be obedient; and that the custom began of the equability that servants had with their masters in the Saturnalia.

Warton tells us 'when the Societies of the Law performed their shows within their own respective refectories, at Christmas, or any other festival, a Christmas Prince, or Rood Master, was constantly appointed. At a Christmas celebrated in the hall of the Middle Temple, in the year 1635, the jurisdiction privileges, and parade of this mock monarch are thus circumstantially described. He was attended by his Lord Keeper, Lord Treasurer, with eight white staves, a Captain of his Band of Pensioners, and of his Guard; and with two Chaplains, who were so seriously impressed with an idea of his regal dignity, that when they preached before him on the preceding Sunday in the Temple Church, on ascending the pulpit, they saluted him with three low bows. He dined both in the Hall and in the Privy Chamber, under a cloth of estate. The pole-axes for his Gentlemen Pensioners were borrowed of Lord Salisbury. Lord Holland, his temporary Justice in Eyre, supplied him with venison on demand; and the Lord Mayor and Sheriffs of London with wine. On Twelfth Day, at going to Church, he received many petitions which he gave to his Master of Requests; and, like other Kings, he had a favourite, whom with others, gentlemen of high quality, he knighted at returning from church. His expenses all from his own purse, amounted to 2000*l.*' After he was deposed, the King knighted him at Whitehall. Stow likewise tells us that the King, every Nobleman, and the Mayor and Sheriffs of London, each had their Lord of Misrule. The name only of the Lord of Misrule is now remembered: for the gloomy Puritans of the reign of James I, suppressed their ludicrous, though costly, frolics.

Why are men and women merry-making and dressed in each other's clothes called Mummers?

Because Mummer signifies a masker; one disguised under a wizard; from the Danish Mumme, or Dutch

Momme. Lipsius tells us, in his 44th epistle, book iii, that Momar, which is used by the Sicilians for a fool, signifies in French, and in our language, a person with a mask on. In Langley's Polydor Vergil we read that 'the disguising and mummyng that is used in Christemas tyme in the northe partes came out of the Feastes of Pallas, that were done with vizars and painted visages, named Quinquatria of the Romaynes.'

The festal character of December and the two following months, it may here be observed, is thus explained by the author of the 'Convivial Antiquities,' who says, 'that as the heathens had their Saturnalia in December, their Sigillaria in January, and the Lupercalia and Bacchanalia in February, so, amongst Christians, these three months are devoted to feasting and revellings of every kind.'

Why was Christmas called the Feast of Lights in the Western or Latin Church?

Because they used many lights or candles at the feast; or rather because Christ, the light of all lights, that true light, then came into the world. Hence the Christmas candles, and what was, perhaps, only a succedaneum, the yule block, or clog, before candles were in general use. Thus, a large coal is often set apart at present, in the north, for the same purpose: i. e. to make a great light or yule on Christmas-eve. Lights, indeed, seem to have been used on all festive occasions. Thus, our illuminations, fire-works, &c, on the news of victories.

The lower class of Irish, in the present time, illuminate their rooms with mould candles; and to this customary illumination at Christmas may be traced the practice of tallow chandlers giving 'Christmas candles' to the children of their customers.

In ancient times, to which we could trace up the origin of these almost absolete customs, blocks, logs, or clogs of dried wood, might be easily procured and provided against this festive season. At that time of day it must have been in the power but of a few to command candles or torches for making their annual illumination. — *Brand* — who, however this may be, is 'pretty confident that the yule block will be found, in its first use to have been only a counterpart of the Midsummer Fires, *(see page 27)* made within doors because of the cold weather at the winter solstice, as those in the hot season, at the summer one, are kindled in the open air.

Why are gifts at Christmas called Christmas boxes?

Because in olden times, the Roman Priests had masses for almost every thing: if a ship went to the Indies, a priest had a *box* in her, under the protection of some saint; and for their masses to be said to that saint, the poor people put something into the priest's box, which was not to be opened till the ship's return. The mass at that time was called *Christmas;* the box called *Christmas-box,* or money gathered against that time, that masses might be made by the priests to the saints to forgive the people their sins at that time; and from this, servants had the liberty to get *box-money* that they too might be enabled to pay the priest for his masses, well knowing the truth of the proverb, 'no penny, no pater-noster. Fosbroke says an altar was erected in every village, where persons gave money. The apprentices' boxes were formerly made of pottery; and Aubrey mentions a pot, in which Roman *denarii* were found, resembling in appearance an earthen Christmas-box.

Why is the Wassail-bowl so called?

Because of its derivation from the Saxon *was-haile,* 'be in health,' which was the form of drinking a health; the customary answer to which was *drinc-heil,* 'I drink your health.'

Verstegan refers it to the time of Hengist, but Selden justly considers it as older. — *Nares.*

Verstegan traces its origin to Vortigern and Rowena, the daughter of Hengist.—On their first interview, she kneeled before him, and presenting a cup of wine, said, *Hlaford Kyning, waes-hail,* 'Lord King, health be to you.' The king, being unacquainted with the Saxon language, asked the meaning of the terms, and being told, that they wished his health, and that he should answer by saying *Drinc-heil,* he did so, and commanded her to drink; then taking the cup, he kissed the damsel and pledged her. From this time the custom long remained in Britain, that whoever drank to another at a feast said *was heil,* and he that received the cup answered *drinc-heil.* The *wassail songs* were sung during the festivities of Christmas, and in earlier times by the itinerant minstrels; of whom, with the practice some remains may be traced in our present *waits and carols.* The *wassail-cup* was anciently placed on the tables of princes, as well as of abbots. In the eleventh volume of the 'Archæologia,' there is an engraving of one of these cups, which formerly belonged to Glastonbury abbey, and a dissertation upon it by Dr Milner. The inside of the cup, which holds two quarts, is furnished with eight pegs, at equal distances, one below the other, in conformity with Edgar's law, to repress excess of drinking. This measurement allowed of half a pint to each person; no doubt this law was 'more honoured in the breach than in the observance.'

Why has the custom of wassailing been restricted to Christmas?

Because an image of our Saviour was originally carried about with the wassail-cup, to which it has been considered as an appendage.

Why is it customary, in some districts, to roast apples on Christmas-eve?

Because roasted apples were formerly carried about with the wassail-cup; and though wassailing is discontinued, the apple custom remains.

Why are waits so called?

Because of the derivation of the term from *wayghtes*, or hautboys, of which, it is not unworthy of remark, there is no singular number. From the instrument its signification was after a time transferred to the performers themselves. The *wayghtes* or waits of ancient times were attendant musicians on great personages, mayors, and bodies corporate, generally furnished with superb dresses, or splendid cloaks; they were in the service of the court in the reign of Edward IV, and had their regular allowance of coals, pitched candles, bread, ale, &c. Todd derives the term from *wahts;* nocturnal itinerant musicians, (Beaumont and Fletcher;) Bayley on account of their waiting on magistrates, &c, or of *guet*, a watch; or from the French *guetter* to watch; because anciently they kept a sort of watch all night. It appears, therefore, that the persons formerly called waites, or waits, were musical watchmen, the word implying *oboes*. They were, in fact, minstrels, at first annexed to the King's Court, who sounded the watch every night; and in towns, paraded the streets, during winter, to prevent theft. At Exeter they were set up with a regular salary, in 1400; and although suppressed by the Puritans, were reinstated in 1660.* — *The Mirror*, 1827.

Why are waits supposed to be of heathen origin?

Because they correspond with a description of persons among the Romans, called *spondaulæ*, from which, it is supposed the *wayghts* or *waits* of our ancient kings were borrowed. The Roman *waites*, or *spondaulæ*, played and sung hymns during sacrifices, whose measure consisted of *spondees* or poetic feet of two long syllables. — *The Mirror*, 1827.

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* The *King's Cock-crower*, an officer comparatively but lately dispensed with by the English Court, probably originated from this system of watching.

Why have commentators puzzled themselves as to the actual food of St John the Baptist in the Wilderness —locusts and wild honey?

Because some writers thought locusts improbable food for the Saint, and accordingly substituted the cassia-fistulata, or *locust-tree*, &c; whereas locusts are an article of food in Persia and Arabia in the present day, they are fried until their wings and legs fall off, and in that state are eaten with rice and dates, &c, and the *wild honey* is found in the clefts of the rocks in Judæa as abundantly as in the caves of Hindustan.—*Forbes's Travels.*

Why has Childermas, or Innocents' Day, been superstitiously considered of unlucky omen?

Because of the murder of the Jewish children by Herod on this day. Brand (from Bourne) says, none ever marry on a Childermas-day. Melton, in his Astrologer, says, it is not lucky to put on a new suit, or begin anything, on that day. The coronation of Edward IV was put off till the Monday, because the preceding Sunday was Childermas-day. The learned Gregory tells us that it was customary, among thirty housewives, 'to whip up the children on Innocents' Day morning, that the memorie of Herod's murder of the Innocents might stick the closer; and, in a moderate proportion, to act over the crueltie again in kinde.'

In allusion to the festivals of St Stephen, St John, and that of Innocents, Mr Wheatley has observed, 'that, as there are three kinds of martyrdom; the first, both in will and deed, which is the highest; the second, in will but not in deed; the third, in deed but not in will;—so the Church commemorates three martyrs in the same order. St Stephen first, who suffered both in will and deed; St John next, who suffered in will, but not in deed; the Holy Innocents last, who suffered in deed but not in will.'

Why were certain days superstitiously considered lucky or unlucky?

Because of a custom among the heathens of observing one day as good, another as bad: some were *dies atri*, and some *dies albi*. The *atri* were pointed out in their calendar with a black character,[*] the *albi* with a white; the former to denote it a day of bad success, the latter a day of good. Thus have the monks, in the dark and unlearned ages of popery, copied after the heathens, and dreamed themselves into the like superstition, esteeming one day more successful than another. — *Bourne.*

Grose tells us, that many persons have certain days of the week and month on which they are particularly fortunate, and others in which they are as generally unlucky. These days are different to different persons. Mr Aubrey has given several instances of both in divers persons. Some days, however, are commonly deemed unlucky; and, among others, Friday labours under that opprobrium. (See *Good Friday*, p. 16.) Likewise, respecting the weather, there is this proverb: —

——— Friday's moon,
Come when it will, it comes too soon.

In the Calendar prefixed to Grafton's 'Manual,' or Abridgment of his Chronicle, 1565, the unlucky days, according to the opinion of the astronomers, are noted, as follows: 'January 1, 2, 4, 5, 10, 15, 17, 29, very unlucky. February 26, 27, and 28, unlucky; 8, 10, 17, very unlucky. March 16, 17, 20, very unlucky. April 7, 8, 10, 20, unlucky; 16, 21, very un-

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[*] Who does not recollect *Black Monday*, or the first Monday after his return to school. The great Lord Burleigh, in his 'Preceptes to his sonne,' says, 'Though I think no day amisse to undertake any good enterprise or businesse in hande, yet have I observed some and no meane clerkes very cautionarie to forbeare these three Mundayes in the yeare, which I leave to thine owne consideration, either to use, or to refuse; — viz. 1. The first Munday in April, which day Caine was born, and his brother Abel slaine. 2. The second Munday in August, which day Sodome and Gomorrah were destroyed. 3. The last Munday in December, which day Judas was born, that betrayed our Saviour Christ.

lucky. May 3, 6, unlucky; 7, 15, 20, very unlucky. June 10, 22, unlucky; 4, 8, very unlucky. July 15, 21, very unlucky. August 1, 29, 30, unlucky; 19, 20, very unlucky. September 3, 4, 21, 23, unlucky; 6, 7, very unlucky. October 4, 16, 24, unlucky; 6, very unlucky. November 5, 6, 29, 30, unlucky; 15, 20, very unlucky. December 15, 22, unlucky; 6, 7, 9, very unlucky.

The observances of such absurdities, both in ancient and modern times, in particular districts, would occupy hundreds of pages. Sir John Sinclair notices, in 1793, Logierait, Perthshire, where 'that day of the week upon which the 14th of May happens to fall, is esteemed unlucky through all the remainder of the year; none marry or begin business upon it. None chuse to marry in January or May; or to have their banns proclaimed in the end of one quarter of the year, and marry in the beginning of the next. Some things are to be done before the full moon; others after. In fevers, the illness is expected to be more severe on Sunday, than on the other days of the week; if easier on Sunday, a relapse is feared.' In some parts of Orkney, we also read, 'in many days of the year they will neither go to sea in search of fish, nor perform any sort of work at home.'

Sir Walter Scott tells us, that the Scottish, even of the better rank, avoid marriage in May. 'This objection is borrowed from the Roman pagans; and the ancients have given us as a maxim, that it is only bad women who marry in that month,—*malæ nubent Maia.*'—*See Letters on Demonology and Witchcraft.*

It is hardly necessary to say a word upon these absurdities. The pretended accuracy with which they were marked out by our ancestors, will at least explain their popular observance.

Why does Fasting differ from Abstinence in the Catholic Church?

Because fasting implies that only one meal a day is to be taken; whereas abstinence merely indicates the abstaining from animal food.

Why do Catholic priests so often change the colour of their dresses?

Because different colours are used on different festivals: thus, the white is used on the feasts of our Lord, of the Virgin, and of all the saints who are not martyrs. The red is used at Whitsuntide, on the Invention and Exaltation of the Cross, and on the feasts of the apostles and martyrs. The purple, or violet, which is the penitential colour, is used on all the Sundays and *ferias* of Advent, and of the penitential time from Septuagesima till Easter: as also on vigils, emberdays, and rogation-days, when the office is of them. Green is also used on Sundays and ferias from Trinity to Advent exclusively, and from the Octave of the Epiphany to Septuagesima exclusively, whenever the office is of the Sunday; but in the Paschal time the white is used. The black is used on Holy (or Good) Friday, and in masses and requiems for the dead; which may be said on any day that is not a Sunday or a double, except the days from Palm Sunday to Low Sunday; and during the Octaves of the Epiphany, of Pentecost, and of Corpus Christi. Paschal time begins on Holy Saturday, and continues to the first vespers on the eve of Trinity Sunday. We quote this from the 'Circle of the Seasons,' the editor of which, a zealous Catholic, observes, that 'many of his readers, who may not be Catholics, but who occasionally go into Catholic chapels, maybe curious to know the rules observed in the choice of colours for the priests' dresses.'

Why are the musical chants of the Catholic Church still retained in Latin?

Because they depend, for metrical effect, on the marked accents and powerful rhymes which the Latin language affords.

Why were texts of Scripture formerly general on church-walls?

Because they were first written there condemning images, upon their removal from churches in England, in 1547.—*Stow.*

DOMESTIC LIFE.

Why are unmarried females called Spinsters?

Because, formerly, women were prohibited from marrying till they had spun a regular set of bed furniture, and till their marriage were consequently called *Spinsters*, which continues till this day in all legal proceedings.

Why does the wedding-ring finger differ from the others?

Because it is the only finger where *two* principal nerves belong to two distinct trunks; the thumb is supplied with its principal nerves from the radial nerve, as is also the fore finger, the middle finger, and the thumb side of the ring finger; whilst the ulnar nerve furnishes the little finger and the other side of the ring finger, at the point or extremity of which a real union takes place; it seems as if it were intended by nature to be the matrimonial finger.

That the side of the ring finger next the little finger is supplied by the ulnar nerve, is frequently proved by a common accident, that of striking the elbow against the edge of a chair, a door, or any narrow hard substance; the ulnar nerve is then frequently struck, and a thrilling sensation is felt in the little finger, and on the same side of the ring finger, but not on the other side of it.

Why was a newly married man formerly called a bridegroom?

Because groom signifies one who serves in an inferior station; and it was customary for the newly married man to wait at table on his bride and friends on his wedding-day.

Why is a month after marriage called the Honey Moon?

Because of its origin from a custom of the Teutones, an ancient people of Germany, to drink mead, or metheglin, a beverage made with honey, for thirty days after every wedding.

Why is an allowance to ladies called pin-money?

Because pins were acceptable new year's gifts to ladies, instead of the wooden skewers which they used till the end of the fifteenth century; and instead of the gifts, a composition was sometimes received in money.

Why is it customary with many persons to present spoons at christenings, or at lying-in visits?

Because of the ancient English custom of presenting spoons, called *apostle-spoons*, from the figures of the twelve apostles being chased or carved on the tops of the handles. Persons who could afford it gave the set of twelve; others a smaller number, and a poor person offered the gift of one, with the figure of the saint after whom the child was named, or to whom the child was dedicated, or who was the patron saint of the goodnatured donor. — A set of these spoons will be found engraved in Mr Hone's *Every-Day Book*, 1825.

Why is the middle meal of the day called dinner?

Because of its corruption from decimer, from decimheure, or the French repas de *dix-heures*.

Why is the last meal called supper?

Because of a similar corruption from *souper*, from the custom of providing soup for that occasion.

Why is not sallet-oil a corruption of salad-oil, as is commonly supposed?

Because the former was used for cleaning the *sallet*, or head-piece of defensive armour in ancient times, and was much less pure than oil used for salads.

Though the sallet is now entirely out of date, yet the oil partially retains its name. — *Gent. Mag.*

Why is a loin of beef called a sirloin?

Because Charles II, once dining upon a loin of beef, was so pleased with his fare, that he said it should be knighted, and the joint henceforth called *Sir-loin.*

Why is furmety so called?

Because of its derivation from *frumentum*, wheat; it being made of that grain, first boiled plump and soft, and then put into and boiled in milk, sweetened and spiced.

Why is the phrase 'humble pie' used for humiliation?

Because, in the middle ages, the shanks and feet of a buck being called umbles, were made into a pie for the retainers of feudal servants.

Why are mattresses considered of great antiquity?

Because they were used by the ancients on couches, upon which, at public festivals, were often laid the images of the gods. They are also sculptured upon several ancient tombs, bearing the figures of the deceased personage. The celebrated Hermaphrodites are also represented on mattresses.

Why is weaving considered of high antiquity?

Because it is mentioned by Abraham, (*Genesis* xiv, 22.) 'I will not take from a thread of the woof, even to a shoe latchet, &c.'

Why is certain fine linen called Damask?

Because it was first manufactured in perfection, at Damascus, in Syria.

Why is a rug so called?

Because of its contraction from *rugget*, Swedish for rough.

Why is the covering of a coach-box called a hammer-cloth?

Because, when coaches were first introduced, our frugal forefathers used to load the carriage with provisions for the family, when they came to London. The *hamper*, covered with a cloth, was a convenient repository, and a seat for the coachman. This was afterwards converted into a box. Hammer-cloth is, therefore, probably a corruption of *hamper-cloth.*

Why is Falstaff's basket called a Buck-basket?

Because *Bouk* is the Scotch word for a ley used to steep foul linen in, before it is washed in water. The buck-basket, therefore, is the basket employed to carry clothes, after they have been *bouked*, to the washing-place. — *Jamieson.*

Why are black, white, yellow, brown, blue and violet, all worn as mourning by different nations?

Because black,(the ordinary mourning in Europe,) or the privation of light, is supposed to denote the privation of life; white (China) is an emblem of purity; yellow (Egypt) is to represent that death is the end of all human hopes, because this is the colour of leaves when they fall; brown (Ethiopia) denotes the earth, to which the dead return; blue (kings and cardinals,) is an emblem of happiness, which, it is hoped, the deceased enjoys; and violet (Turkey) is supposed to express a mixture of sorrow and hope.

Why were the titles of Lord and Lady first adopted?

Because of the origin of lord from the Saxon *laford*, or loaf-giver, from his maintaining a number of dependents; and *lady* from *leaf-dien*, or *loaf-dian*, i. e. loaf-server, she serving it to the guests, or carving at table.

Why has a literary lady been satirically termed a Blue-Stocking?

Because of the origin of the term from the Society 'de la Calza,' (*of the Stocking*) formed at Venice in the year 1500; the members being distinguished by the colour of their stockings, the prevailing colour of which was *blue*. The Society de la Calza lasted the year 1590, when the foppery of Italian literature took some other symbol. The rejected title then crossed the Alps, and branded female pedantry in Paris. It diverged from France to England, and for a while marked the vanity of the small advances in literature of our female côteries. But the propriety of its application is now gradually ceasing; for we see in every circle, that attainments in literature can be accomplished with no loss of womanly virtue.—*Mills' Hist. of Chivalry.*

Why do servants' liveries differ?

Because they originated in our British ancestors clothing their vassals in uniform, to distinguish families; as they painted arms and symbols on their clothes for the same purpose.

Why were vineyards extirpated from England?

Because (as affirmed in the *Biographia Britannica*,) 'of some treaty of peace between France and England, in which it is stipulated, that we should root up our vineyards, and be their customers for all our wine.' This is quoted by Mr Ellis, in his *Introduction to Domesday*, who adds: 'if such extirpation of the English vineyards was not owing to this, it might be to the falling of Gascony into the hands of the English, whence wine was imported cheaper and better than we could make it.'

Why were the libations to the gods, in Roman sacrifices, sometimes made with milk?

Because of the great scarcity of wine, which was not in general use till about 600 years U. C.

Why were the Roman women saluted by their near relations on receiving visits from them?

Because the visiters might smell whether the women had tasted any wine, which gave their husbands a right to punish them, or even to kill them.

Why did the Roman drunkards take pumice-stone before drinking for a wager?

Because it might excite their thirst. This probably gave rise to the invention of 'devils,' common among the topers of our times.

Why are chequers painted against the sides of public-houses?

Because, in early times, a chequered board, the emblem of calculation, was hung out, to indicate an office for changing money. It was afterwards adopted as the sign of an inn, or hostelry, where victuals was sold, or strangers lodged and entertained.

Why is the horse-keeper at an inn, called an ostler?

Because *ostler* is derived from the word *hostel*, which was formerly obtained from the French, and was in common use here to signify an inn; and the innkeeper was from thence called the *hosteller*. This was at a period when the innkeeper or *hosteller* would be required by his guests to take and tend their horses, which, before the use of carriages, and when most goods were conveyed over the country on the backs of horses, would be a chief part of his employment; and hence, the *hosteller* actually became the *hostler*, or *ostler*, that is the horse-keeper. — *Hone.*

Why is it said that 'good wine needs no bush?'

Because, in early times, before inns were established on public roads, those who had wine to sell, by way of a sign, hung out a bush; hence it became a saying, that 'good wine would find customers without a bush.'

Why is a drinking-glass called a rummer?

Because of its corruption from the Dutch *roemer*.

Why is a milk-man's reckoning called a tally?

Because it is a relic of the rude contrivance of registering by tallies, introduced into England at the period of the Norman conquest. These consist of straight, well-seasoned sticks, of hazel or willow, so called from the French word *tailler*, to *cut*, because they are squared at each end. The sum of money was marked on the side with notches, by the cutter of tallies, and likewise inscribed on both sides by the writer of the tallies. The smallest notch signified a penny, a larger one a shilling, and one still larger a pound; but other notches, increasing successively in breadth, were made to denote ten, a hundred, or a thousand. The stick was then cleft through the middle by the deputy chamberlains, with a knife and a mallet; the one portion being called the *tally*, and the other the *countertally*, or *folium*.

Hence also the origin of the tally-trade, or receiving payment for goods by instalments.

Why are mixed liquors called 'grog?'

Because Admiral Vernon who was the first to mix his sailors' allowance of spirits with water, was nicknamed 'Old Grog,' from his wearing a grogram coat, and this name was given to the mixed liquor he compelled his fleet to drink.

Why did tavern-keepers originally call portions of liquor 'goes'?

Because of the following incident, which, though unimportant in itself, convinces us how much custom is influenced by the most trifling occurrences.

The tavern called the Queen's Head, in Duke's Court, Bow Street, was once kept by a facetious individual of the name of Jupp. Two celebrated characters, Annesley Spay and Bob Todrington, a sporting man, meeting one evening at the above place, went to the bar, and each asked for half a quartern of spirits, with a little cold water. In the course of time, they drank four-and-twenty, when Spay said to the other, 'Now we'll go.'—'O no,' replied he, 'we'll have another, and then go.' This did not satisfy the gay fellows, and they continued drinking on till three in the morning, when both agreed to GO; so that, under the idea of going, they made a long stay. Such was the origin of drinking, or calling for, *goes*. — *Etymological Compendium.*

Why was the house built by David Hartley, on Putney Heath, fireproof?

Because it was built with double floors, between the boards of which were sheets of iron and copper; thus rendering the floor air-tight, and intercepting the ascent of heated air; so that, although the inferior boards were actually charred, the metal prevented the combustion of the superior boards; although the sheets were not thicker than tin-foil, or stout paper.

In 1774, the king and queen breakfasted in an upper room of Hartley's house, while, in the room beneath, fires were lighted on the floor, &c; and in this, and other experiments, the fires in the lower rooms had been so strong, that parts of the joists in the floor above were charred, although the boards which lay upon them were in no degree affected. Parliament voted Mr Hartley 2,500*l*, to defray the expenses of this building: the invention has sunk into obscurity, although the spot is recorded by a pompous obelisk.

Why is a chimney-piece also called a 'mantel'?

Because it is work raised before a chimney, to conceal it, *mantel* originally signifying a cloak.

Why are chimneys comparatively of modern origin?

Because they are not mentioned earlier than the year 1347. If the houses of the ancient Romans had been furnished with chimneys, Vitruvius would have described them; yet not a word about them is to be found in his works. Nor does Julius Pollux, who made a collection of the Greek names of all parts of habitations, give a word for them, any more than Grapaldus, who, in more modern times, formed a vocabulary of all the Latin words used in architecture.

That there were no chimneys in the 11th, 12th, and 13th centuries, seems proved by the curfew *(couvre feu)* of the English and Normans. In the lower ages, the fire was made in a sort of stove, which the law required should be covered up on retiring to bed. The allusion at the above date (1347) is to an earthquake at Venice, which threw down many chimneys.

Why is it probable that the Britons taught the art of basket-making to the Romans?

Because Martial mentions a basket brought to Rome by painted Britons; whence we infer that baskets of British manufacture were esteemed in the capital of the world.

Why do we conclude that earthenware was firs tintroduced into Britain by the Romans?

Because, in the locality of the present Staffordshire potteries, are found, on sinking pits, very evident remains of Roman potteries, and at a considerable depth below the present surface of the land. It is supposed, also, that one of the principal Roman potteries was on a small island (now sunk) at the mouth of the Thames, from the numerous fragments of earthern vessels which the fishermen often find entangled in their nets.

Why is glass so called?

Because of its resemblance to ice, *(glacies)* or, as others suppose, from *glastum*, the English *woad*, a vegetable which is employed in dyeing *blue*; glass having generally a tinge of blue in its appearance.—*Blancourt on Glass.*

Why is the hole in a gun called the touch-hole?

Because our fire-arms were at first discharged by applying a lighted match to the touch-hole, and consequently by *touching* the hole, as is now done in firing great guns. And though that method is now left off, by means of the later improvement of the lock, the hole still keeps its old name.

Why is a French-horn so called, although made of metal?

Because, at first, *horns* were used both for blowing and drinking; and the name continued, though both the drinking and the blowing horn were made of ivory, silver, brass, &c.

Why is treacle so called?

Because it is a corruption of *theriacal*, originally *theriaca*, an antidote to the bite of a serpent. Though the treacle of the apothecary, and the grocer's treacle, or molasses, are not now used with any such intention, they still keep a name borrowed from the first intention of the medicine or antidote. — *Gent. Mag.*

Why is the broom so called?

Because it was formerly made of the shrub *broom*; although the name is now applied to implements made of birch, or hogs' bristles.

Why was a candlestick formerly called a candlestaff?

Because, before metals were used, nothing but a stick was employed, and the candle held by a slit at one end, or three nails driven in the stick.

Why is a mirror so called?

Because of its origin from the French, *mirer*, to look at.

Why is soap considered to be of high antiquity?

Because it is mentioned by one of the Hebrews: 'Though thou wash thee with nitre, and take much *soap*, yet thine iniquity is marked before me. — *Jeremiah*, ii, 22.

Why is the web of the spider called a cobweb?

Because cobweb is from the Dutch word *kopwebbe*; and *kop* in that language signifies a spider.

LAW.

Why were woolsacks first used in the House of Lords?

Because, in the reign of Elizabeth, an act of parliament was passed to prevent the exportation of

English wool; and the *woolsacks* on which the judges sat, were placed there to remind them to watch this staple commodity of the kingdom.

Why was the Saxon Parliament called the Wittenagemot?

Because a *witte* was anciently a wise man; and the *wittenagemot* an assemblage of wise men.

Why is a member of parliament said to accept the Chiltern Hundreds?

Because he wishes to retire; but as he cannot resign, the king may grant him the office of steward to the Chiltern Hundreds, the acceptance of which vacates his seat. The Chiltern Hundreds are crown lands in Bedfordshire and Bucks, not far from Aylesbury; their topographical name arising from the chalky nature of the hills, of which they principally consist.

Why are certain electors called pot-wallopers?

Because they derive their right to vote from having a fire-place, on which they may *wallop*, or boil a pot. *Pot-waller*, used in the acts of parliament, is not so correct an expression as the common one.

Why was the celebrated cabinet council of Charles II, called the Cabal?

Because the initials of the names of the five councillors formed that word, thus—

Clifford
Arlington
Buckingham
Ashley
Lauderdale.

Why is Common Law also termed Lex non scripta, or unwritten law?

Because it is not set down in writing, as acts of parliament are.

Why are the sittings of law-courts called terms?

Because of their origin from Terminus, the heathen god of boundaries.

Why is the Court of King's Bench so called?

Because our kings formerly presided there, as judges do now.

Why is the Court of Exchequer so called?

Because a *chequered* cloth anciently covered the table where the chief officers sat. — *Maitland.*

Why is the Prerogative Court so called?

Because of the Prerogative of the Archbishop of Canterbury, who by a special privilege, can here try all disputes concerning wills and administrations of persons who have left goods of five pounds value, without the diocese wherein they died; unless settled by composition.

Why was the Star Chamber so called?

Because of its derivation from *Starrum*, a barbarous word for a Jewish contract. — *Barrington.* It is also said to have been named from its roof being painted with silver or gilt stars.

Why is one of our Law Colleges called Doctors' Commons?

Because the several courts and offices of which the college is now composed, were anciently dispersed, and held in several parts of the city of London, which being relative, and in some measure depending one upon another, occasioned great inconvenience to the respective practitioners; wherefore the doctors and proctors of the several courts, united in a collegiate manner, and by dining together *in common*, obtained the appellation of 'Doctors' Commons.'

Why is one of our Law Courts called 'the Arches?'

Because it was formerly held in the Church of St Mary-le-Bow, which was built on *arches.*

Why are certain writs called Pone, Qui Tam, Latitat, Habeas Corpus, &c?

Because they were the first Latin words with which they began when they were written in Latin; or, at least, from some remarkable word in them. In a writ of *Latitat*, the person sued is supposed to conceal himself—from *Latitat*, he lies hid.

Why are sheriff's officers vulgarly called bum-bailiffs?

Because the latter is a corruption of bound-bailiffs, so called from their being bound to the sheriffs for the due execution of their duties.

Why is a certain law officer called a tipstaff?

Because he attends the judges with a staff tipped with silver, and takes into his charge all prisoners who are committed or turned over at judges' chambers.

Why have judges a nosegay placed before them in court?

Because it is the relic of a primitive and ancient custom of the judge holding the *bough* or sceptre of justice, in his hand; it was formerly called a bouquet or little bough, whence the French took their word *bouquet*, for a nosegay.

Why were jurors originally confined from meat and drink?

Because of the propensity of the olden Britons to eat and drink to excess, whence it became expedient to hold them in custody until they had agreed upon their verdict.

Why are surgeons exempt from serving on coroners' juries?

Because, in the year 1513, the corporation of surgeons, consisting of twelve, a number being then thought equal to the care of the metropolis, petitioned parliament to be exempt from bearing arms or serving on juries and parish offices; and their petition was successful.—*Andrews's Hist. of England.*

Why are butchers exempt from serving on coroners' juries?

Because of an act of parliament passed 1661, for that purpose. Upon this bill it is observed: 'It is very strange that so judicious and humane an enactment had not been passed before; not that they (butchers) should be considered as devoid of the common feelings of humanity, but more liable to its infirmities, from their avocations necessarily compelling them to the performance of a duty incompatible with those feelings which they hitherto had been called upon to exercise in the capacity of jurymen.' *M'Queen's Historical Records.*

Why are chartered and corporation towns supposed to have origin in garrison service?

Because the generality of such towns have been garrisons; and the corporations were charged with the gates of the towns, when no military garrison was present. Their refusing, or granting, admission to strangers, which has produced the custom of giving, selling, and buying freedoms, has more of the nature of garrison authority than civil government.

Soldiers are free of all corporations throughout the kingdom, by the same propriety that every soldier is free of every garrison, and no other persons are. He can follow any employment, with the permission of his officers, in any corporation town.

Why is a city hall called a Guildhall?

Because Guild signified among the Saxons a fraternity, derived from the Saxon word *to pay:* every man paid his share towards the expenses of the community, whence the place of meeting was called Guild, or Guildhall.

Why is the Lord Mayor of London annually presented to the Lord Chancellor?

Because, though King John granted to the citizens of London a charter, impowering them to choose their own mayor, yet by the same power they were generally obliged to present him to the king for his approbation, or, in his absence, to his justiciary.

Why is a chief magistrate called a Mayor?

Because of its origin from the Teutonic *Meyer*, a lover of might.

Why is the Court of Pie Poudre so called?

Because of its origin from *pie poudre, curia pedis pulverizati*, from the dusty feet of the suitors; or, as Sir Edward Coke says, because justice is there done as speedily as dust can fall from the feet. Blackstone thinks with Daines Barrington, it is from *pied puldreaux*, (a pedlar in old French) and says it signifies the court of petty chapmen at fairs or markets. Fosbroke says, courts similar to *pie poudre* courts were common among the Greeks and Romans, who introduced fairs into Germany and the North.

Why is the dagger quartered in the London arms?

Because it was granted in commemoration of Sir William Walworth, who, having felled Wat Tyler with his mace, despatched him with his dagger.

Why are certain parishes said to be within the Bills of Mortality?

Because, during the plague of 1592-5, bills or registers of these parishes were kept, to ascertain the number of persons who died; but when the pestilence ceased, the bills were discontinued. They were resumed in 1603. — *Pennant.*

Why was the nightly watch first established in London?

Because upon the discontinuance of the curfew-bell in the time of Henry I, as Stow observes, 'it followed, by reason of warres within the realm, that many men gave themselves up to robbery and murders in the night;' and the City of London was subject to these disorders till 1253, when Henry III, commanded watches to be kept in cities and borough towns, for the preservation of the peace, and further, that if from that time any murder or robbery was committed, the town in which it was done should be liable to the damages thereof.

Why are certain outrages called the Black Art?

Because (according to Blackstone,) of its origin from devastations committed near Waltham, in Hampshire, by persons in disguise, or with their faces blackened, who seem to have resembled the Roberdsmen, or followers of Robert Hood, that in the reign of Richard I, committed great outrages on the borders of England and Scotland.

It seems that many years ago, a party of the inhabitants of this town retired to a recluse dell in the New Forest, whence they issued forth in the night; and their numbers rendering them formidable, they committed great depredations in the neighbourhood, killing deer, sheep, &c, for their subsistence. As they commonly made their appearance in the night, and were disguised, moreover, as above mentioned, they were called the 'Waltham Blacks.' The place of their retreat was a recess, accessible only by a subterranean passage. They dressed like foresters; the cross-bow was their weapon; and it is asserted that they called themselves the descendants of Robin Hood. In this licentious state, they remained a considerable time, till at last they were dispersed by the activity of the neighbouring gentlemen, and have not since infested the country.

Why were the old robbers called cut purses?

Because formerly before the introduction of pockets, purses were carried in the hand or borne at the side, when the thieves cut them away, and carried them off with the contents. Pickpockets are of modern origin: they came upwith the wearing of pockets.

Why were strong liquors formerly administered to the criminals before execution?

Because the strength of the liquor might stupify their senses, or deaden their feeling of pain; this, says the Talmud, was given immediately before the execution began, and consisted of a cup of wine mingled with a quantity of frankincense. Certain charitable or compassionate women at Jerusalem were engaged to prepare this draught, which they did by mixing with the wine drugs or bitter herbs to produce stupefaction. Pennant likewise tells us, that a practice somewhat similar prevailed in England; it being customary to present to malefactors on their way to the gallows, in ancient times, a large bowl of ale, as the last refreshment they were to receive in this life.

The foundation of this custom appears to have been laid in the command of Solomon, 'Give strong drink to him that is ready to perish, and wine to those that be of heavy heart.' Allusion is made to the same species of drink in the book of the prophet Jeremiah, written nearly four hundred years afterwards. Perhaps of a similar nature was the bowl of wine which Homer tells us Helen presented to her guests, when oppressed with grief, to raise their spirits; the composition of which she had learned from the Egyptians:

Meanwhile, with genial joy to warm the soul,
Bright Helen mix'd a mirth-inspiring bowl;
Tempered with drugs of sovereign use, t'assuage
The boiling bosom of tumultuous rage;
Charm'd with that virtuous draught, the exalted mind
All sense of woe delivers to the wind.

Why is 13½*d said to be 'hangman's wages?'*

Because the Scottish mark, (not ideal or nominal money, like our mark,) was a silver coin, in value thirteen-pence half-penny, and two placks, or two-thirds of a penny, which plack is likewise a coin. Thus, their mark, bears the same proportion to their pound, which is twenty-pence, as our mark does to our pound, or twenty shillings, being two-thirds of it. This Scottish mark was, upon the union of the two crowns, in the person of James I, made current in England, at the value of thirteen-pence half-penny. This, probably, was a revolution in the current money in favour of the hangman, whose fee before was perhaps no more than a shilling. There is, however, very good reason to conclude, from the singularity of the sum, that the odious title of *hangman's wages*, became, at that time or soon after, applicable to the sum of thirteen-pence half-penny. Though it was contingent, yet it was then very considerable pay, when one shilling per day was a standing annual stipend to many respectable officers of various kinds.

Why is political change called 'ratting?'

Because of the following circumstance: — In Spain, when the famous Duke of Lerma was overthrown, all the Lermates disappeared in a few days. At the fall of the Duke of Lerma, which occasioned so many removals from office, our James I, expressing his astonishment, inquired the cause of the facetious Gondemar, who replied in the following apologue. To illustrate the fall of the duke and his creatures, he told how, once two rats, having entered a palace, were delighted at the spacious apartments, and the frequent banquets. They whisked about unmolested, — every day seemed a festival, — and they at last concluded that the palace was built for them. Their presence was not even suspected. But, grown bolder by custom, they called in shoals of rats and ratlings, and each filled his appointment. Some were at the larder, some were in the dinning-room, some here, and some there. The little rapacious creatures were a race of lascivious livers; they dipped their whiskers in every dish, and nibbled at the choicest morsels. Not a department but had its rats. The people in the palace now began to cry out that there were rats without number; and having once made up their minds as to the fact, they laid traps for them here and there, and cast ratsbane up and down the palace. — *D'Israeli.*

Why is a man put on his trial called a culprit?

Because of the corruption of the replication of the clerk of arraigns to the plea—*non culpabilis.* '*Cul*' (for *culpabilis*,) '*prit*,' that is, 'ready to prove you so.'—*Blackstone.*

Another conjecture is, that the clerk, after the plea of not guilty, expressed a benign wish in French, '*Qu'il parait*,' may it appear so—which was corrupted into the word '*culprit.*'

Why are lawyers also called attorneys?

Because, in the time of our Saxon ancestors, the freemen in every shire met twice a year, under the precedency of the shire-reeve, or sheriff, and this meeting was called the Sheriff's Torn. By degrees, the freemen declined giving their personal attendance, and a freeman who did attend, carried with him the proxies of such of his friends as could not appear. He who actually went to the Sheriff's Torn, was said, according to the old Saxon, to go 'at the Torn,' and hence came the word *attorney;* which signified one that went to the Torn for others, carrying with him a power to act or vote for those who employed him. The distinction between attorney and solicitor arises from the latter practising in a Court of Equity, and the former only in a Court of Law.—*Heraldic Anomalies.*

END OF PART III.

KNOWLEDGE FOR THE PEOPLE:

OR THE

PLAIN WHY AND BECAUSE.

PART IV.—ZOOLOGY.—BIRDS.

ZOOLOGY.

BIRDS.

GENERAL ECONOMY.

Why are birds said to constitute, as it were, an isolated class of beings?

Because they are distinguished, by certain characters, from all other animals: their classification does not pass into any other, and cannot, therefore, be consistently introduced into the supposed chain or gradation of natural bodies. With regard to form, all birds coincide in having two feet, two wings, a bill, (either partly or entirely horny,) and a body covered with feathers. — *Blumenbach.*

Birds are extremely important creatures in the economy of Nature in general; although their immediate utility to mankind is infinitely less than that of mammifera. They destroy innumerable insects; and the thoughtless extirpation of some birds, supposed to be noxious, as sparrows, crows, &c, in many districts, has generally given rise to an infinitely more prejudicial multiplication of vermin. Other birds destroy larger animals, as field-mice, snakes, frogs, lizards, or consume carrion. Many extirpate weeds. On the other hand, they assist the increase and propagation of animals as well as plants. For instance, it is known that wild-ducks, in their emigrations, carry impregnated spawn into remote ponds, &c, and thus stock them with fish.* Many birds swallow seeds, which are subsequently expelled whole, and thus extensively dispersed: as the doves of Banda, with the nutmeg. The excrement of sea-birds manures bare cliffs and coasts, so as to render them capable of producing useful plants. Many species of falcons may be taught for the chase, as well as the cormorant for taking fish. Many birds, together with their eggs, fat, &c, serve for food; the entire skins of sea-birds for the clothing of many Northern nations; the feathers for stuffing beds, for writing, for various and often costly ornaments; in which respect, also, they form an important article of trade among many savage people, particularly the islanders of the Pacific Ocean. — *Blumenbach.*

Why are birds usually classed according to the forms of their bills and feet?

Because those parts are connected with their mode of life, food, &c, and influence their total habit very materially. — *Blumenbach.*

Why have birds little power of suction?

Because of the narrowness and rigidity of their tongue; as may be seen when they drink, having to hold up their heads, and depend upon the weight of the water for transmitting it into the craw. — *Rennie.*

Why are birds said to be 'poised' in the air?

Because the centre of gravity of their bodies is always below the insertion of their wings, to prevent them falling on their backs, but near that point on which the body is, during flight, as it were, suspended.

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* Insects have also been known to stock ponds on hills with fish. The huge water-beetle, which feeds upon the spawn of fish, occasionally, in the evening, climbs up the stems of rushes, &c, out of the water, so as to take wing: in these circumstances it has been caught, and, on being put into water, has been found to give out the spawn with which it had gorged itself previous to taking flight, both in a digested and undigested state; so that, on trial, it has been found to produce fish of various kinds. — *Jameson.*

The positions assumed by the head and feet are frequently calculated to accomplish these ends,and give to the wings every assistance in continuing the progressive motion. The tail also is of great use, in regulating the rise and fall of birds, and even their lateral movements. — *Fleming.*

Why do birds fly?

Because they have the largest bones of all animals, in proportion to their weight; and their bones are more hollow than those of animals that do not fly. Air-vessels also enable them to blow out the hollow parts of their bodies, when they wish to make their descent slower, rise more swiftly, or float in the air. The muscles that move the wings of birds downwards, in many instances, are a sixth part of the weight of the whole body; whereas, those of a man are not in proportion one-hundredth part so large.

Why does flying differ from leaping?

Because flying is the continued suspension, and progress of the whole body, in the air, by the action of the wings. In leaping, the body is equally suspended in the air, but the suspension is only momentary. In flying, on the contrary, the body remains in the air, and acquires a progressive motion by repeated strokes of the wings on the surrounding fluid. — *Fleming.*

In swimming on the surface of the water, the legs of birds are exclusively employed; but when motion is accomplished beneath the surface, the wings are then chiefly in exercise.

Why are birds covered with feathers?

Because, by this addition to the non-conducting appendices of the skin, birds are enabled to preserve the heat, generated in their bodies, from being readily transmitted to the surrounding air, and carried off by its motions and diminished temperature. — *Fleming.*

Why are the strongest feathers of birds in the pinions and tail?

Because the pinion-feathers may form, when the wing is expanded, as it were, broad fans, by which the bird is enabled to raise itself in the air and fly; whilst its tail feathers direct its course.—*Blumenbach.*

Why are some few birds unfit for flight?

Because they have scarcely any pinion feathers. —*Blumenbach.*

Why do birds moult?

Because they may be prepared for winter; this change being analogous to the casting of hair in quadrupeds. During summer, the feathers of birds are exposed to many accidents. Not a few spontaneously fall: some of them are torn off during their amorous quarrels; others are broken or damaged; whilst, in many species, they are pulled from their bodies to line their nests. Hence, their summer dress becomes thin and suitable. Previous to winter, however, and immediately after incubation and rearing of the young is finished, the old feathers are pushed off in succession by the new ones, and thus the greater part of the plumage of the bird is renewed.—*Fleming.*

Why do certain birds appear to change colour in passing from one place to another?

Because colour is the gift of light. Thus, the indigo-bird appears at one time of a rich sky-blue, at another of a vivid verdigris green. When the angle of incidence in the rays of light reflected from the plumage of the bird is acute, the colour is green, when obtuse, blue. The colour of the head being of a very deep blue, is not affected by any change of position.

Why does the plumage of many Northern birds change from a dark colour to a pure white, on the approach of winter?

Because such change increases the warmth of the birds; the white colour reflecting heat most readily, and suffering it to escape but slowly by radiation.

The completeness of this provision for the changes of the season, is beautifully illustrated by the deep colours of the summer dress of birds, being exchanged for the white colour of winter, with a rapidity and extent proportional to the changes of the seasons. During a mild autumn, the shifting of the dark for the light-coloured dress proceeds at a very slow pace; and when the winter also continues mild, the white dress is never fully assumed. In some species, as the black guillemot, the white winter dress is never acquired *in this climate*, although its ash-coloured plumage intimates a tendency to the change. In the climate of Greenland, on the other hand, the change is complete, and the plumage is of a snowy whiteness.* — *Fleming.*

Why is it erroneous to imagine, that Northern birds, by thus becoming white, are better enabled to escape their foes, from their resemblance to the colour of the snow?

Because, if their white dress concealed them from their enemies, these last, by being deprived of their ordinary food, would be in danger of starvation and death. Neither is this variation of colour confined to weak or defenceless animals. Beasts and birds of prey are likewise subject to the change. Hence, if it yielded protection to some, it would enable others to prey with greater certainty of success on their defenceless neighbours; and would not thus be consistent with the wisdom and benevolence of the Creator. The popular opinion on the subject must, therefore, be relinquished; especially as the change of colour, from dark to white, does not vary, however different the habits, or even stations, of the animals may be, in which it takes place. — *Fleming.*

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* Similar changes occur in Quadrupeds: — see Part II, p. 8, of the present work; and for the difference of dark and white clothing, generally, Part I, p. 59.

Why do birds change the form of their eyes?

Because, when flying in the air, and meeting with many obstacles, as branches and leaves of trees, birds require to have their eyes sometimes as flat as possible, for protection; but sometimes as round as possible, that they may see the small objects, (flies and other insects) which they are chasing through the air, and which they pursue with the most unerring certainty. This could only be accomplished by giving them a power of suddenly changing the form of their eyes. Accordingly, there is a set of hard scales placed on the outer coat of their eye, round the place where the light enters; and over these scales are drawn the muscles or fibres by which motion is communicated; so that, by acting with these muscles, the bird can press the scales, and squeeze the natural magnifier of the eye into a round shape, when it wishes to follow an insect through the air; and can relax the scales, in order to flatten the eye again, when it would see a distant object, or move safely through leaves and twigs. This power of altering the shape of the eye is possessed by birds of prey in a very remarkable degree. They can see the smallest objects close to them, and can yet discern larger bodies at vast distances, as a carcass stretched upon the plain, or a dying fish afloat on the water. A singular provision is made for keeping the surface of the bird's eye clean, for wiping the glass of the instrument, as it were, and also for protecting it, while rapidly flying through the air, and through thickets, without hindering the sight. Birds are, for these purposes, furnished with a third eye-lid, a fine membrane or skin, which is constantly moved very rapidly over the eyeball by two muscles placed in the back of the eye. One of the muscles ends in a loop, the other in a string which goes through the loop, and is fixed in the corner of the membrane, to pull it backward and forward.

Why have birds more varied motion in the neck than quadrupeds?

Because in birds the neck has a greater number of bones, and consequently of joints: the contrivance by which the spine of animals is rendered susceptible of varied motion, being by means of a strong chain of bones, (vertebræ) locked together by means of knobs and projections, to prevent dislocation, a chain which stretches from the head to the extremity of the tail. Except in the three toed sloth, indeed, the bones in the neck of quadrupeds and of man are uniformly seven in number; the short-necked mole having the same as the long-necked giraffe; in birds, the number is never less than nine, and varies from that to twenty-four. — *Rennie.*

Why do birds sing?

Because of the receptacles of air already mentioned; but particularly by the disposition of the larynx, which in birds is not, as in mammifera and amphibia, placed wholly at the upper end of the windpipe; but, as it were, separated into two parts, one placed at each extremity. Parrots, ravens, starlings, bulfinches, &c, have been taught to imitate the human voice, and to speak some words: singing birds also, in captivity, readily adopt the song of others, learn tunes, and can even be made to sing in company, so that it has been possible actually to give a little concert by several bulfinches. In general, however, the song of birds in the wild state, appears to be formed by practice and imitation. — *Blumenbach.*

Why cannot birds be so correctly said to sing as to whistle?

Because natural singing is an exclusive privilege of man. — *Blumenbach.*

Why do the notes of different species of birds vary?

Because, probably, of the structure of the organs of each species enabling them more easily to produce the notes of their own species, than those of any other, and from the notes of their own species being more agreeable to their ears. These conditions, joined to the facility of hearing the song of their own species, in consequence of frequenting the same places, determine the character of the acquired language of the feathered tribes. —*Fleming.*

Those who have paid attention to the singing of birds, know well that their voice, energy, and expression, differ as widely as in man; and, agreeably to this remark, Mr Wilson, the celebrated ornithologist, says he was so familiar with the notes of an individual wood-thrush, that he could recognise him among all his fellows the moment he entered the woods.

Why are birds equally dispersed in spring over the face of the country?

Because, during that amorous season, such a jealousy prevails between the male birds, that they can hardly bear to be seen together in the same hedge or field. Most of the singing and elation of spirits, of that time, seem to be the effect of rivalry and emulation. — *G. White.**

Why is August the most mute month, the Spring, Summer, and Autumn through?

Because many birds which become silent about Midsummer, reässume their notes in September; as the thrush, blackbird, woodlark, willow-wren, &c. — *G. White.*

Why is it inferred that birds possess some notion of power, and of cause and effect?

Because of the various actions which they perform. Thus, for example, we have seen the hooded-crow in Zetland, when feeding on small shell-fish, able to break some of the tenderer kinds by means of its bill, aided, in some cases, by beating them against a stone; but, as some of the larger shells, such as the buckie and the wilk, cannot be broken by such means, it employs another method, by which, in consequence of applying foreign power, it accomplishes its object. Seizing the shell with its claws, it mounts up into the air, and then loosing its hold, causes the shell to fall among stones, (in preference to the sand, the water, or the soil on the ground) that it may be broken, and give easier access to the contained animal. Should the first attempt fail, a second or a third is tried, with this difference, that the crow rises higher in the air, in order to increase the power of the fall, and more effectually remove the barrier to the contained morsel. On such occasions, we have seen a stronger bird remain an apparently inattentive spectator of the process of breaking the shell, but coming to the spot with astonishing keenness when the efforts of its neighbour had been successful, in order to share in the spoil. Pennant mentions similar operations performed by crows on mussels. — *Fleming.*

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* White's Natural History of Selborne.

Why do birds congregate in hard weather?

Because, as some kind of self-interest and self-defence is, no doubt, their motive, may it not arise from the helplessness of their state in such rigorous seasons; as men crowd together, when under great calamities, they know not why? Perhaps approximation may dispel some degree of cold; and a crowd may make each individual appear safer from the ravages of birds of prey and other dangers. – *G. White.*

Why do long-billed birds grow fat in moderate frosts?

Because of the gentle check which the cold throws upon insensible perspiration. The case is just the same with blackbirds, &c; and farmers and warreners observe, the first, that their hogs fat more kindly at such times; and the latter, that their rabbits are never in such good case as in a gentle frost. But when frosts are severe, and of long continuance, the case is soon altered; for then, a want of food soon overbalances the repletion occasioned by a checked perspiration. I have observed, moreover, that some human constitutions are more inclined to plumpness in winter than in summer. — *G. White.*

Why do we so often fail in rearing young birds?

Because of our ignorance of their requisite food. Every one who has made the attempt, well knows the various expedients he has resorted to, of boiled meats, bruised seeds, hard eggs, boiled rice, and twenty other substances that Nature never presents, in order to find a diet that will nourish them; but Mr Montagu's failure, in being able to raise the young of the curl-bunting, until he discovered that they required grasshoppers, is a sufficient instance of the manifest necessity there is for a peculiar food in one period of the life of birds. — *Knapp.**

Why have birds that live on seeds, a crop?

Because they swallow the grains unbroken, and the crop, abounding with glands, softens the seeds, which are thence gradually propelled into the stomach. The latter is in birds extremely muscular, and so powerful, that, according to the remarkable experiments of Reaumur and others, it is able to break nuts and olive kernels, and to wear the impressions on pieces of money as smooth as paper. — *Blumenbach.*

Why do voracious birds, when devouring their quarry, swallow bones and feathers, and all matters indiscriminately?

Because the bones, feathers, &c, assist to promote digestion.

Why do birds swallow little pebbles?

Because they assist in the division and subsequent digestion of their food. Physiologists have differed as to the object and use for which stones are thus swallowed. Many have even supposed that it proceeds from stupidity. According to my own investigation, it is an indispensable measure of assistance to digestion, by depriving the seeds swallowed of their vitality, without which they would not yield to the digestive powers. – *Blumenbach.*

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* Journal of a Naturalist, 1829.

Why have most nocturnal birds large eyes and ears?

Because large eyes are necessary to collect every ray of light, and large concave ears to command the smallest degree of sound or noise.

Why are aquatic nocturnal birds, as cranes, wild ducks, &c, very noisy and loquacious?

Because their perpetual clamour prevents them from dispersing, and losing their companions.

Why are certain birds called 'waders?'

Because they usually frequent marshy grounds, and the margin of rivers, and wade among the mud or water. All of them are qualified for flying, by the size of their wings, and for running, by the length of their legs.

Why do some birds stand for a great length of time on one foot only, without much exertion?

Because of the length of the toes, and the manner in which they are disposed, joined to the disposition of the body with regard to its centre of gravity. Thus, in the *stork*, 'the surface of the femur, (or thigh-bone,) that articulates (or joins) with the tibia, (or the largest leg bone) has, in its middle, a depression which receives a projection of the latter bones. In bending the leg, this process is lifted out of the depression, and removed to its posterior edge. By this motion the ligaments are necessarily more stretched than during the extension of the leg, in which the process remains in its socket. These ligaments, therefore, preserve the leg extended in the manner of some springs, without receiving any assistance from the muscles.' — *Cuvier.*

Why have many genuine land birds the middle toe connected by a web with the outer toe, as far as the first joint?

Because the sole of the foot is thus increased, and better adopted for standing or walking on the ground.

Why have some birds a claw cut like a saw or short-toothed comb?

Because they may comb out or rid their plumage of its vermin.

Why do some birds roll themselves in dust?

Because it may free them from annoyances, or prevent the bites of insects. — *Knapp.*

Why has it been asked whether Mahomet and his followers might not take one method of purification from these pulvatrices?

Because it is found from travellers of credit, that if a strict Mussulman is journeying in a sandy desert, where no water is to be found, at stated hours he strips off his clothes, and most scrupulously rubs his body over with sand or dust. — *G. White.*

Why are certain birds of a flock called sentinels?

Because they observe approaching danger, and speedily communicate it to the whole flock. In some cases these sentinels are deceived by false appearances. Dr Edmonstone, in his 'View of the Zetland Isles,' gives a very striking illustration of this neglect of the sentinel, in his remarks on the Shag. 'Great numbers of this species of the cormorant are sometimes taken during the night, while asleep on the rocks, and the mode of accomplishing it is very ingenious. Large flocks sit, during the night, on projecting rocks of easy access, but before they commit themselves to sleep, one or two of the number are appointed to watch. Until these sentinels are secured, it is impossible to make a successful impression on the whole body; and, to surprise them is therefore the first object. With this view, the leader of the expedition creeps cautiously and imperceptibly along the rock, until he gets within a short distance of the watch. He then dips a worsted glove in the sea, and gently throws water in the face of the guard. The unsuspecting bird, either disliking the impression, or fancying, from what he considers to be a disagreeable state of the weather, that all is quiet and safe, puts his head under his wing and soon falls asleep. His neck is then immediately broken, and the party despatch as many as they choose.'

Why is the new arrangement of birds called 'quinary?'

Because it proposes to arrange them in groups of *fives*, thus: *Raptores*, or birds of prey; *Insessores*, or perching birds; *Rasores*, or gallinaceous birds; *Grallatores*, or wading birds; *Natatores*, or web-footed birds. Each of these is divisible into *fives*; and again into *fives*. The details of the arrangement would occupy too much space in the present work; and for them the reader is referred to several papers on the subject by Mr Vigors, the ingenious secretary of the Zoological Society, who thinks the proposed arrangement to be strictly in accordance with the natural varieties of birds. It may be observed here, as a curious fact, that 'by far the greater number of the pie and sparrow tribe in this country, and perhaps elsewhere, generally lay *five* eggs; the rook, the crow, the hedge-sparrow, goldfinch, blackbird, thrush, &c. The advocates of the *quinary* arrangement will doubtless advance this in corroboration of their system.'*

Why are some birds called monogamous?

Because they pair, (from *monogamia*, one marriage.)

Why are other birds called polygamous?

Because they never, unless compelled, confine themselves to individual association.—(From *polygamia*, many marriages.)

The whole number of birds enumerated by Linnæus, specifically, is only 960; while those described by Dr Latham, in his recently published work, amount to about 5,000.

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* Jennings' Ornithologia.

Why do birds exceed quadrupeds in the quantity of their respiration?

Because they have not only a double circulation and an aërial respiration, but they respire also through other cavities besides the lungs, the air penetrating through the whole body, and bathing the branches of the aorta, or great artery of the body, as well as those of the pulmonary artery. — *Cuvier.*

Why is parental affection more obvious in birds than in other animals?

Because most of their young remain in the nests, wherefore the parents have no cessation of labour from early morning to the close of eve, till the brood can provide for themselves. The young of beasts, on the other hand, sleep much; some are hidden in lairs and thickets nearly all the day, others take food only at intervals or stated periods, the parent ruminating, feeding, or reposing, too. — *Knapp.*

Why are birds called oviparous?

Because they produce their young from the egg, (*ovum* an egg, and *pario* to bring forth.)

Why is there attached to the upper mandible of all young birds about to be hatched, a horny appendage?

Because the birds may more effectually perforate the shell, and thus contribute to their own liberation. This sharp prominence or appendage, becomes opposed to the shell at various points, in a line extending throughout its whole circumference, about one-third below the larger end of the egg; and a series of perforations, more or less numerous, is thus effected by the increasing strength of the bird, weakening the shell in a direction opposed to the muscular power of the little captive, which is thus ultimately enabled, by its own efforts, to break the walls of its prison. In the common fowl, this horny appendage falls off in a day or two after the chick is hatched; in the pigeon, it sometimes remains on the beak ten or twelve days: this arises, doubtless, frethe young pigeons being fed by the parent bird some time after being hatched; and thus there is no occasion for the young using its beak to pick up food.

This singular fact was first noticed by Mr Yarrel, a clever contributor to the *Zoological Journal.*

Why are the eggs of birds enclosed in a shell?

Because the shell or calcarcous coating, which consists of carbonate and phosphate of lime, is to unite with the white of the egg, and form, during incubation, the feathers and bone of the future young ones; but, as a large portion of this covering remains after the young are produced, its other object is to guard from injury the parts within.—*Knapp.*

Why is it puzzling to identify the eggs of birds when detached from their nests?

Because the eggs vary so much, and the colourings and markings differ greatly in the same species, and even nest.

Why is it concluded that the colouring matter on the shells of eggs does not contribute to the various hues of the plumage?

Because, though the calcareous matter is partly taken up during incubation, the markings upon the eggs remain little injured, even to the last, and are almost as strongly defined, as when the eggs are first laid. Again, eggs entirely white will produce birds with a variety of plumage.—*Knapp.*

Why is artificial incubation but seldom successful?

Because of the great difficulties in graduating the heat properly.

For a Table of the respective periods, see *Brande's Journal,* 1829.

Why do stale eggs float upon water?

Because, by keeping, air is substituted for a portion of the water of the egg, which escapes.—*Prout.*

Why has the breast-bone of all birds which fly, a long ridge or keel?

Because muscles are attached to it, to facilitate their flight.

Why has it been playfully said that birds pair on Valentine's Day?

Because, however puerile the notion itself may be, it is certain that about the above period, or sooner or later in the spring, many birds cease their gregarious association, and meet only in pairs for incubation and rearing their young.

Why is it thought that the songs of birds are the effect of pleasurable sensations?

Because most birds sing only during fair weather. Some of them will occasionally sing even during wet weather: many of the thrush tribe do so. Mr Bowles illustrates this in the following simile:—

> As some lone bird at day's departing hour,
> Sings in the sunbeam of the transient shower,
> Forgetful though its wings be wet the while.

Why does one sex only of birds sing?

Because as Buffon supposed, of cheering his mate during the period of incubation; but this idea, gallant as it is, has but slight foundation in probability: and, after all, perhaps, we must conclude, that, listened to, admired, and pleasing as the voice of many birds are, either for their intrinsic melody, or from association, we are uncertain what they express, or the object of their song. The singing of most birds seems entirely a spontaneous effusion, produced by no exertion, or occasioning no lassitude of muscle, or relaxation of the parts of action. In certain seasons and weather, the nightingale sings all day and most part of the night; and we never observe that the powers of song are weaker, or that the notes become harsh and untuneable, after these hours of practice. The cuckoo is probably the only bird that seems to suffer from the use of the organs of voice.

Why do birds sing comparatively louder than man?

Because the strength of the larynx, and of the muscles of the throat in birds is infinitely greater than in the human race. The loudest shout of the peasant is but a feeble cry, compared with that of the golden-eyed duck, the wild-goose, or even the woodlark.

Birds of one species sing in general very like each other, with different degrees of execution. In the thrush, however, it is remarkable, that there seem to be no regular notes; each individual piping a voluntary of his own. — *Knapp.*

Why do most of our little songsters, when captured as old birds, become in confinement sullen and dispirited?

Because want of exercise and of particular kinds of food, and their changes, alter the quality of their fluids: they become fattened, and indisposed to action, by repletion; fits and ailments ensue, and they mope and die. — *Knapp.*

Why is it reasonable to conclude that the notes used by birds, and the voices of animals, are the same as uttered by the earliest progenitors?

Because, could we find a people, from Japan to the Pole, whose progress in mind has been stationary, without increase of idea, from national prejudice or impossibility of communication with others, we should probably find little or no alteration in the original language of that people: so, by analogy of reasoning, the animal having no idea to prompt, no new want to express, no converse with others — for a note caught and uttered, is merely like a boy mocking a cuckoo; so *no new language is acquired.* This fact is also corroborated by various little scraps of intelligence scattered through the sacred and ancient writings. With civilized man all is progressive; with animals, where there is no mind, all is stationary. — *Knapp.*

Why have birds that feed on grain and seeds a gizzard?

Because the gizzard, being covered with very strong muscles, by its action, comminutes the food. Other birds, that are carnivorous or piscivorous, have a stomach more resembling that of carnivorous quadrupeds; the digestion of such birds being more accelerated by the gastric juice than by the action of the stomach itself.

Why are hedge fruits, as hips and haws, sometimes refused by birds?

Because the summer has been ungenial, the berries have not ripened well, but have been nipped by frost, and hang on the sprays, dark in colour, small, and juiceless in substance.

Why is it best to feed very small birds with meat?

Because animal food most readily assimilates with the fluids of their bodies, with the least efforts of the digestive powers.

Why do many birds sleep on trees?

Because the motion of the branches produced by the wind, increases their disposition for sleep. This may be exemplified in the common fowl: for, placing its bill under the wing, even in broad daylight, and swaying it to and fro in the hand for a very short time, will produce sleep; a beautiful proof of the adaptation of birds to the function.—*Jennings.*

Why do not birds fall down in sleeping on their perch?

Because such is the structure of their feet and legs, that the greater the weight upon the muscles, the more firmly the claws grasp whatever they lay hold of.

Why does the signal of danger among birds seem to be of universal comprehension?

Because, the instant that it is uttered, we hear the whole flock, though composed of various species, repeat a separate moan, and away they all scuttle into the bushes for safety.—*Knapp.*

Why is the eagle and some other birds enabled to bear the strongest light of the sun?

Because it has a membrane (*see page* 8,) with which the bird can, at will, cover the pupil of the eye, while the eyelids remain open.

Why are aqueous birds better supplied with food than those on land?

Because fish, the food of the former, are probably but little influenced by season; while our poor land birds find theirs to be nearly annihilated in some cases.

Why is the plumage of aquatic birds kept dry?

Because the small feathers next the bird fall over each other like the tiles of a roof, and thus throw off the water.

Paley tells us that the '*laminæ* or layers of the feathers of birds are kept together by teeth that hook into each other, "as a latch enters into the catch, and fastens a door."'

Why have birds two united glands on the rump?

Because these glands secrete a mucous oil, which can be pressed out by the bill of the bird, to anoint its feathers, and replace them when they are discomposed. Aquatic birds have their feathers dressed with this oil from first leaving the shell, but the feathers of other birds are pervious to every shower. Thomson thus alludes to this oleous unction:—

> 'The plumy people streak their wings with oil,
> To throw the lucid moisture off.'

Why have birds the pip?

Because the oleous glands just described, become diseased and swollen. It is generally remedied by a single puncture, by which the collected fluid may be discharged. — *Jennings' Ornithologia.*

Why do dab-chicks, moor-hens, and coots, fly erect, with their legs hanging down, and hardly make any despatch?

Because their wings are placed too forward out of the true centre of gravity; as the legs of auks and divers are situated too backward. — *G. White.*

Why do penguins, and birds of the same group walk nearly upright?

Because the legs are placed farther back than in other birds.

Why is the ancient custom of giving parish rewards for the destruction of small birds as vermin, still continued?

Because it may have been requisite in former times, to keep under or reduce the numbers of many predaceous animals, which, in a thickly wooded country, with an inferior population, might have been productive of injury; and we even find parliamentary statutes enacted for this purpose: but now, however, our loss by such means has become a very petty grievance; our gamekeepers do their part in removing pests of this nature, and the plough and the axe leave but little harbour for the few that escape; and thus we war on the smaller creatures of creation, and call them vermin. An item passed in one of our churchwardens' accounts, was, 'for seventeen dozen of tomtits' heads!' In what evil hour, or for what crime, this poor little bird can have incurred the anathema of a parish, it is difficult to conjecture. The price set upon its head is four-pence per dozen, probably the ancient payment when the groat was a coin. — *Knapp.*

MIGRATION.

Why has the existence of migration been denied?

Because of the surprise, how migrating birds could support themselves so long on wing, as to accomplish their journeys, and at the same time live without food during their voyage. These difficulties, however, vanish altogether if we attend to the rapidity of the flight of birds. Hawks and many other birds probably fly at the rate of 150 miles an hour: an eider-duck at 90 miles an hour: Sir George Cayley computes the common crow to fly at nearly 25 miles an hour; and Spallanzani found that of the swallow about 92 miles, while he conjectures the rapidity of the swift to be nearly three times greater. A falcon which belonged to Henry IV of France, escaped from Fontainbleau, and in twenty-four hours afterwards was found at Malta, a distance computed to be no less than 1530 miles; a velocity nearly equal to 57 miles an hour, supposing the falcon to have been unceasingly on the wing. But, as such birds never fly by night, and allowing the day to be at the longest, his flight was perhaps equal to 75 miles an hour. If we even restrict the migratory flight of birds to 50 miles an hour, how easily can they perform their most extensive migrations! Fair winds may perhaps aid them at the rate of 30 or 40 miles an hour; nay with three times greater rapidity. — *Fleming.*

The migrations of the feathered tribes have been the object of popular observation, since the days of the prophet Jeremiah: 'For the stork in the heaven knoweth her appointed times; and the turtle and the crane, and the swallow, observe the time of their coming.' *(ch.* viii, *v.* 7.)

Why are certain migrating birds called Summer Birds of Passage?

Because they arrive in this country in the spring, and depart from it in the winter.

Why are other migrating birds called Winter Birds of Passage?

Because they arrive in autumn, and depart in spring.

Why may the autumnal shifting of birds, with propriety, be termed their Equatorial Migration?

Because all those species in which it is observed, move from the Pole towards the Equator, in search of the temperature congenial to their constitutions, and which the winter of the district of their summer residence could not afford. — *Fleming.*

Why may the vernal shifting, with equal propriety be termed the Polar Migration?

Because all the species recede with the increasing temperature of the high latitudes of the Equator, and approach towards the Pole. — *Fleming.*

Why do certain birds migrate to mild countries on the approach of winter?

Because they are unable sufficiently to provide against the vicissitudes of the seasons, by varying the quantity and colour of their dress; but are thus protected by shifting their quarters, so as to live throughout the whole year in a temperature congenial to their constitutions. — *Fleming.*

Why are birds sometimes found at sea, in a very exhausted state, on the rigging of ships?

Because, in their annual migrations, birds are occasionally overtaken by stórms of contrary wind, and carried far from their usual course.

Mr White, however, in his *Natural History of Selborne*, says, 'It does not appear to me that much stress may be laid on the difficulty and hazard that birds must run in their migrations, by reason of vast oceans, cross-winds, &c; because, if we reflect, a bird may travel from England to the Equator without launching out or exposing itself to boundless seas — and that by crossing the water at Dover, and again at Gibraltar. And I with the more confidence advance this obvious remark, because my brother has always found that some of his birds, particularly the swallow kind, are very sparing of their pains in crossing the Mediterranean; for, when arrived at Gibraltar, they do not —

Ranged in figure, wedge their way,
——and set forth
Their airy caravan high over seas

Flying, and over lands with mutual wing
Easing their flight; — *Milton.*

but scout and hurry along in little detached parties of six or seven in a company; and sweeping low, just over the surface of the land and water, direct their course to the opposite continent, at the narrowest passage they can find. They usually slope across the bay to the south west, and so pass over opposite to Tangier, which, it seems, is the narrowest space.'

Why do the periods of the arrival and departure of migrating birds vary in different years?

Because they depend entirely on the changes of the seasons. Thus, the meanest rustic, in regard to the summer birds of passage, is aware, that cold weather prevents the arrival of these messengers of spring; and that the early arrival of our winter birds of passage, indicates a proportionally early winter.

Why is the arrival of these summer birds to be partly prognosticated by the leafing or flowering of particular trees or plants?

Because the same circumstances of temperature which retard the birds, also check the progress of vegetation. As the state of vegetation depends on the temperature of the season, and the life of the insects, (the food of birds) on the state of vegetation, we may safely conclude, that the movements of the phytivorous (vegetable-eating) and insectivorous birds must be dependent on the condition of plants. — *Fleming.*

Why is torpidity also called hybernation?

Because it is evidently designed to afford animals protection against the cold of winter.

Actual torpidity in birds is very rare; yet the few instances on record establish the fact, while they point to the numerous resources of Nature in extreme cases, to preserve existence.

Why were seven of the migratory birds formerly called the Seven Sleepers?

Because it was then supposed that many birds, which, it is now known, unquestionably migrate, retired to some secure retreat, and there remained dormant during the winter. — *Jennings.*

Why does the early arrival of wild geese and ducks, and other migrating birds from the north, in the winter, portend that a severe season is approaching?

Because the *early* appearance of these birds is most likely caused by severe frost having already set in, at their usual summer residence. — *Jennings.*

Why do the bird-catchers in the neighbourhood of London, procure males only on the first arrival of this bird?

Because the males of many species of migrating birds appear to perform their migrations a few days before the females; and this is remarkably the case with the nightingale. The females do not make their appearance for a week or ten days after the males. — *Fleming.*

BRITISH AND EUROPEAN BIRDS.

EAGLES.

Why has so much confusion arisen in the names of several of the eagle species?

Because of the great changes in the colour of the feathers of several of the genus, during their process to maturity.

THE HAWK.

Why was the practice of hawking discontinued?

Because of the introduction of the use of gunpowder.

Aristotle, Pliny, and many other ancient writers, speak of the method of catching birds by means of hawking; but it is said, that falconry was practised with far more spirit and universality among the ancient Britons, than in any other nation.

Why is the falcon so honourable an emblem of heraldry?

Because, in former times, and in many countries, the custom of carrying a falcon about was esteemed a mark of a man of rank: many persons of distinction were painted with a hawk on the hand.

Why is the village of Falconsward, in Holland, so called?

Because a race of falconers was there born and bred, whence supplies have been drawn for the service of all Europe; but as there has been no sufficient inducement for the young men to follow the employment of their forefathers, numbers are dead, or worn out; and there only remains John Pells, now in the service of John Dawson Downes, Esq. of Old Ginton Hill, Suffolk. — *Sir John Sebright*, 1827.

Why is the Icelander highly esteemed by falconers?

Because it is the largest hawk that is known, and is of great power and the most tractable disposition. The gyr-falcon is less than the Icelander, but much larger than the slight falcon. These powerful birds are flown at herons and hares, and are the only hawks that are fully a match for the fork-tailed kite. The merlin and hobby are both small hawks, and fit only for small birds, as the blackbird, &c. The sparrow-hawk may be also trained to hunt; his flight is rapid for a short distance, he kills partridges well in the early season, and is the best of all for land-rails. — *Sir John Sebright.*

OWLS.

Why was the owl the emblem of wisdom among the Greeks?

Because its skull is elevated: it is, however, without a proportionate volume of brain.

Linnæus, with many other naturalists and antiquaries, have supposed that the horned owl was the bird of Minerva. Blumenbach has, however, shown, from the ancient works of Grecian art, that it was not this, but rather some smooth-headed species, probably, the *passerina*, or little owl.

Why are barn-owls more numerous than brown-owls?

Because the young of the brown-owl are not so easily raised, as they want a constant supply of fresh mice; whereas, the young of the barn-owl will eat indiscriminately all that is brought: snails, rats, kittens, puppies, and any kind of carrion or offal.—*G. White.*

Why is the owl thought to be of the same sympathy or kindred likings as those of the cat?

Because a young owl has been found to feed well and thrive upon fish. Cats too, it is well known, like fish, and Dr Darwin relates an anecdote of a cat taking fish in a mill-pool. Both the cat and the owl too feed upon mice. The sight of owls also, similar to that of cats, appears to serve them best in the dark. *(See page 29.)*

Why are white owls vulgarly called screech-owls?

Because of their horrible screaming as they fly along. This species of owl, some people superstitiously believe, attends the windows of dying persons.

Mr White, in one of his delightful Letters to Mr Pennant, says, 'My musical friend, at whose house, (Fyfeld, near Andover) I am now visiting, has tried all the owls that are his near neighbours, with a pitch-pipe set at concert pitch, and finds they all hoot in B flat. He will examine the nightingales next spring.' From what follows this note, it, however, appears, that 'neither owls nor cuckoos keep to one note'

Why is the plumage of the wings of owls remarkably soft and pliant?

Because they should not make much resistance or rushing, that they may steal through the air unheard upon a nimble and watchful quarry.— *G. White.*

Why do owls, in flying, stretch out their legs behind them?

Because they may balance their large heavy heads; for, as most nocturnal birds have large eyes and ears, they must have large heads to contain them.— *G. White.*

Major Head thus describes the *biscacho*, or coquimbo, a curious species of owl, found all over the Pampas of South America.

'Like rabbits, they live in holes, which are in groups in every direction, and which makes galloping over these plains very dangerous. These animals are never seen in the day; but, as soon as the lower limb of the sun reaches the horizon, they are seen issuing from their holes in all directions, which are scattered in groups, like little villages, all over the Pampas. The biscachos, when full grown, are nearly as big as badgers, but their head resembles a rabbit's, except that they have large bushy whiskers. In the evening they sit outside their holes, and they all appear to be moralising. They are the most serious looking animals I ever saw; and even the young ones are gray-headed, wear mustachios, and look thoughtful and grave. In the day-time, their holes are guarded by two little owls which are never an instant away from their posts. As one gallops by these owls, they always stand looking at the stranger, and then at each other, moving their old-fashioned heads in a manner which is quite ridiculous, until one rushes by them, when fear gets the better of their dignified looks, and they both run into the biscacho's hole.'

Why has the night-jar the middle claw cut into serratures, like a saw or a short-toothed comb?

Because it may rid its plumage of vermin or dirt, by combing.

Wilson, the distinguished American ornithologist, also tells us that the inner edge of the middle claw of the whip-poor-will* is pectinated, and from the circumstance of its being found with small portions of down adhering to the teeth, is probably employed as a comb, to rid the plumage of its head of vermin, this being the principal and almost the only part so infested in all birds. Of another species, called chuckwill's widow, he says, 'their mouths are capable of prodigious expansion, to seize with more certainty, and furnished with long hairs or bristles, serving as palisades to secure what comes between them. Reposing much during the heats of the day, they are much infested with vermin, particularly about the head, and are provided with a comb on the inner edge of the middle claw, with which they are often employed in ridding themselves of these pests, at least when in a state of captivity.'

Why is the fern owl, or night-jar, popularly called the goatsucker?

Because of an erroneous notion that it sucks goats; a thing, which the structure of its bill renders impossible.

THE SHRIKE.

Why is the shrike or butcher-bird, also called by Linnæus, a sentinel?

Because it seldom conceals itself in a bush, but sits perched on some upper spray, or in an open situation, heedful of danger, or watching for its prey.

THE WOODPECKER.

Why do woodpeckers tap with their bill the trees on which they sit?

Because they may disturb the insects concealed within, so as to seize them when they appear.

Why is the white-billed woodpecker called the carpenter's bird?

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* See Foreign Birds.

Because of the great quantity of chips which it makes.

This bird, and the order to which it belongs, are termed *peckers*, and have a very remarkable structure of the tongue, consisting of two long cartilages, which are placed immediately under the skin, running from behind forwards over the skull, and terminating at the forehead near the root of the bill. These cartilages, are like springs, by means of which the bird can more readily protrude its worm-shaped tongue, and transfix insects with its horny point. — *Blumenbach.*

THE KINGFISHER.

Why is the term halcyon used figuratively for quiet?

Because the halcyon or kingfisher was feigned by the poets. to breed in the sea, and that there was always a calm during her incubation. —

> As firm as the rock, and as calm as the flood,
> Where the peace-loving halcyon deposits her brood.
> *Cowper.*

THE DOTTREL.

Why is the dottrel every year becoming more and more scarce in the vicinity of Keswick?

Because some parts of its plumage are in very great request by the manufacturers of artificial flies for fishing, which accounts for their being pursued and killed in such numbers.

ROOKS.

Why is the rook one of the earliest birds?

Because its principal food is worms, which feed and crawl upon the humid surface of the ground in the dusk, and retire before the light of day; and, roosting higher than other birds, the first rays of the sun, as they peep from the horizon, become visible to it. — *Knapp.*

Why do rooks sometimes appear to be falling to the ground?

Because they are scratching themselves with one foot, and thus lose their centre of gravity. — *G. White.*

Why is a flock of rooks so frequently attended by a train of starlings?

Because rooks have a more discerning scent than starlings, and can lead them to spots more productive of food. Anatomists say that rooks, by reason of two large nerves which run down between the eyes into the upper mandible, have a more delicate feeling than other round-billed birds, and can grope for their meat when out of sight. Perhaps, then, their associates attend them from interest, as greyhounds wait on the motions of their finders, and as lions are said to do on the yelpings of jackals. — *G. White.*

Why are rooks' eggs prized?

Because, though bearing little resemblance to those of the plover, they are, in some places, not uncommonly taken, and sold as plover's eggs in the London market; and, probably, the habitual eater of them can alone distinguish a sensible difference.

Why are rooks less abundant than formerly?

Because their haunts have been disturbed by the felling of trees, in consequence of the increased value of timber, and the changes in our manners and ideas. Rooks love to build near the habitation of man; but their delight, the long avenue, is no longer the fashion; and the poor birds have been dispersed to settle on single distant trees, or in the copse, and are captured and persecuted. In many counties, very few rookeries remain, where once they were considered as a necessary appendage, and regularly pointed out the abbey, the hall, the court-house, and the grange. — *Knapp.*

The following anecdote of the rook is related in the *Zoological Journal*, and merits introduction here, for the excellent lesson it affords to man. 'A gentleman occupied a farm in Essex, where he had not long resided, before numerous rooks built their nests on the trees surrounding his premises; the rookery was much prized; the farmer, however, being induced to hire a larger farm about three quarters of a mile distant, he left the farm and the rookery; but, to his great surprise and pleasure, the whole rookery deserted their former habitation, and came to the new one of their old master. It ought to be added, that this gentleman was strongly attached to all animals whatsoever, and, of course, used them kindly.'

Why is a hot summer fatal to rooks?

Because their food, grubs, insects, and worms, is then mostly hidden in the earth beyond their reach. At this time, were it not for its breakfast of dew-worms, which it catches in the gray of the morning, as it is appointed the earliest of risers, it would commonly be famished. In the hot summer of 1825, many of the young brood of the season perished from want; the mornings were without dew, and consequently few or no worms were to be obtained. —*Knapp.*

RAVENS.

Why is the raven most common on the shores of harbours, or near great rivers?

Because animal substances, its food, are more frequently to be met with there, than in inland places. In Greenland and Iceland, where putrescent fishy substances abound, they appear to be almost domesticated.

Why is the raven one of the chosen birds of superstition?

Because of its supposed longevity, its frequent mention and agency in holy writ; the obscure knowledge we possess of its powers and motives; and the gravity of its deportment, like an 'all-knowing bird,' which has acquired for it, from very remote periods, the veneration of mankind. The changes in our manners and ideas, in respect to many things, have certainly deprived them of much of this reverence; yet the almost supernatural information which they obtain of the decease, or approaching dissolution, of an animal, claims still some admiration for them. This supposed faculty of 'smelling death' formerly rendered their presence, or even their voice, ominous to all, as

> The hateful messenger of heavy things,
> Of death and dolour telling;

and their unusual harsh croak, still, when illness is in the house, with some timid and affectionate persons, brings old fancies to remembrance, savouring of terror and alarm. — *Knapp.*

The poets have highly embellished this superstition: Drayton says: —

> The greedy raven, that doth call for death.

and quotes Pliny for his authority. Shakspeare —

> The raven himself is hoarse,
> That croaks the fatal entrance of Duncan
> Under my battlements. *Macbeth.*

Sir Walter Scott: —

> All nations have their omens drear,
> Their legions of wild woe and fear.
> To Cambria look — the peasant see,
> Bethink him of Glendowerdy,
> And shun 'the Spirit's Blasted Tree.' — *Marmion* —

in the notes to the sixth canto of which are the following lines in a poem by the Rev. George Warrington, entitled '*the Spirit's Blasted Tree.*'

> Three ravens gave the note of death
> As through mid air they wing'd their way;
> Then o'er his head in rapid flight,
> They croak — they scent their destined prey.
>
> Ill omen'd bird! as legends say,
> Who hast the wondrous power to know,
> While health fills high the throbbing veins,
> The fated hour when blood must flow!

Sir Walter Scott: —

> Seems he not Malice, like a ghost
> That hovers o'er a slaughter'd host?
> Or *Raven* on the blasted oak
> That, watching while the deer is broke,
> His morsel claims with sullen croak.
> *Lady of the Lake.*

THE MAGPIE.

Why does the magpie cover its nest with thorns?

Because its eggs may thus be protected from birds; a danger which it seems to understand, by its feeding on the eggs of others.

THE JAY.

Why was the jay formerly persecuted through all its retreats?

Because the beautiful blue-barred feathers, that form the greater coverts of the wings, distinguish it from every other bird; wherefore they were much in request in the days when feather-work was in fashion with our fair country-women.

THE CUCKOO.

Why has the cuckoo a broad, hollow back?

Because, soon after the young cuckoo is hatched by the hedge-sparrow, the eggs, or the young ones, whichever should happen to be in the nest, are turned out of it by the cuckoo, and by it alone; to effect which, the cuckoo is conjectured to have this peculiar conformation of the back.

[We quote this observation from a paper by Dr Jenner, in the *Philosophical Transactions* for 1788; premising the anomaly of the cuckoo laying its eggs in other birds' nests, to be familiar to the reader. We have not space to pursue the subject further, neither will the details of a controversy be looked for in the present work. Mr Jennings has sensibly observed — 'The truth seems to be, notwithstanding all that has been observed and published concerning the cuckoo, that its natural history is still involved in considerable obscurity.']

Till lately, it was not known that any bird laid its eggs in the nests of other birds, besides the cuckoo; it is now, however, well ascertained, that the American cowpen, or cow-bunting, lays its eggs in other birds' nests, and takes no care whatever of its offspring. — *Jennings.*

Why are cuckoos supposed to migrate in succession?

Because the cuckoo, seldom seen in company with his mate, even during the breeding season, is, to all appearance, equally solitary at the period of migration.

Why may the cuckoo be said to have done much for musical science?

Because from that bird has been derived the *minor scale*, whose origin has puzzled so many; the cuckoo's couplet being the *minor third* sung downwards. — *Mag. Nat. Hist.*

THE MISSEL-BIRD.

Why is the missel-bird, in Hampshire and Sussex, called the storm-cock.

Because it sings early in the spring, in blowing, showery weather. — *G. White.*

THE LARK.

Why do the songs of the sky-lark and wood-lark differ?

Because the song of the sky-lark is very sweet, full of harmony, extremely cheerful, and known and admired by all; but the voice of the woodlark is local, not so generally heard, from its softness must almost be listened for to be distinguished, and has not any pretensions to the hilarity of the former.

The ill-fated Shelley has some exquisite lines to a sky-lark: —

Hail to thee, blithe spirit;
Bird thou never wert,
That from heaven or near it,
Pourest thy full heart
In profuse strains of unpremeditated art.
Higher still and higher
From the cloud thou springest,
Like a cloud of fire;
The deep blue thou wingest,
And singing still dost soar and soaring ever singest.

* * * * * * *

Teach me half the gladness
That thy brain must know,
Such harmonious madness
From my lips would flow,
The world should listen then, as I am listening now.*

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* See the 'Beauties of Shelley,' 18mo. 1830.

SWALLOWS.

Why is the submersion of swallows during winter, in lakes and rivers, an improbable occurrence?

Because swallows are much lighter than water, and could not sink in clusters, as they are represented to do. If their feathers are previously wetted, to destroy their buoyant power, in what manner can they resist the decomposing effect of six months' maceration in water, and appear in spring as fresh and glossy as those of other birds? Swallows do not moult while they remain with us in an active state; so that, if they submerge, they either do not moult at all, or perform the process under water. In the case of other torpid animals, some vital actions are performed, and a portion of oxygen is consumed; but in the submersed swallows, respiration, and consequently, circulation, must cease. Other torpid animals, too, in retiring to their winter slumbers, consult safety: while the swallow, in sinking under the water, rushes to the place where the otter and the pike commit their depredations. It is now ascertained that migration is in ordinary cases practised by the swallow; yet their submersion has been believed by many naturalists; — such as, Klein, Linnæus, and others. — *Fleming.*

Why are swallows rarely seen in London, although they are numerous in the suburbs?

Because flies are not so plentiful in London as in the open country, and most of the chimneys have conical tops to them; which, if they do not preclude, are certainly no inducement for their building in such places; the top of a chimney being its favourite site for its nest. — *Jennings.*

Why are 'chimney swallows' improperly so called?

Because they by no means build altogether in chimneys, but often within barns and out-houses, against the rafters. In Sweden, the swallow builds in barns, and is called *lada swala,* the barn swallow. — *G. White.*

Why may fine weather be expected or continued, when swallows fly high, and rain when the birds fly low and close to the ground?

Because swallows pursue the flies and gnats, and flies and gnats usually delight in warm strata of air; and as warm air is lighter, and usually moister, than cold air, when the warm strata of our air are high, there is less chance of moisture being thrown down from them by the mixture with cold air; but when the warm and moist air is close to the surface, it is almost certain that, as the cold air flows down into it, a deposition of water (or rain) will take place. — *Sir H. Davy.*

Why, after swallows have disappeared for some weeks, are a few occasionally seen, and that only for one day?

Because, probably, they withdraw, and slumber in some hiding-place during the interval; for it cannot be supposed that they had migrated, and so returned again for one day: more probably, they are awakened from sleep, and, like the bats, are come forth to collect a little food. — *G. White.*

Why is a certain species of swallow called 'esculenta,' or edible?

Because its nests are eaten as great delicacies. They are found in the Indian Archipelago, and form an article of trade to the China market, where those of the first quality fetch their weight in gold! They are used to make soup, to which are ascribed powerfully restorative qualities. The substance of which these nests consist, resembles isinglass, and is disposed in irregular, transverse threads, with a few feathers interposed. Neither the analytical experiments of Dobereiner, nor those of Brande demonstrate it to be of animal origin. The relatively small portion of ammonia, indeed, which it yields, and its facility of incineration, rather lead to the conclusion that it is a vegetable gum. It was once supposed to be procured from the scum of the sea. Those individuals, however, residing fifty miles from the sea, employ the same materials as those which dwell on the shore. The other species in those districts likewise employ a portion of the same substance in the fabrication of their nests. — *Fleming.*

THE STARLING.

Why do starlings probably migrate to this country alone?

Because few other birds could travel so long, and continue such a rapid motion.

From some rude observations, it appears probable, that a pair of starlings in conjunction do not travel less than fifty miles in the day, visiting and feeding their young about one hundred and forty times, which, consisting of five in number, and admitting only one to be fed each time, every bird must receive in this period eight and twenty portions of food or water.

THE CROSS-BILL.

Why is the cross-bill so called?

Because the mandibles of the beak do not lie upon each other, with their lateral edges in opposition, as in other birds, but *cross*, or curve to the right and left, and always in opposite directions to each other. In some specimens, the upper mandibles curve downwards and to the left, the under portion turned upwards, and to the right. — *Mr Yarrel, in the Zoological Journal.*

Why is the cross-bill so destructive in orchards?

Because it feeds upon the seeds of the apple, by cutting the fruit asunder with its well-constructed mandibles, in order to obtain the kernels.

THE BULFINCH.

Why is a snowy, severe winter, peculiarly destructive to the bulfinch?

Because it feeds in this season upon the 'hips' of the dog-rose, which are scarce in hard weather; when they are gone, it seems to pine for food, and is starved, or perhaps frozen, on its roost, as few are observed to survive a long inclement winter.

Why do bulfinches often become wholly black?

Because they are fed on hemp-seed. Such influence has food on the colour of animals! The pied and mottled colours of domesticated animals, are supposed to be owing to high, various, and unusual food. — *White.*

Why do bulfinches pipe?

Because they are taken, when very young, from their nests, and taught by a barrel-organ. Their tuition is a task of strict discipline, and is commenced when they first begin to whistle, or at the age of two months. They are taught in classes of about six in number; they are naturally great mimics; the barrel-organ is of a single diapason, and only plays one air. The birds, before they make their first essay, are comparatively starved, are placed in a dark room round the organ, and the air is played slowly to them. The moment they mimic the organ, the light is admitted into the room, and a little food is given to them; this is repeated so often, and works upon them so mechanically, that the organ is to them a sure presage of their being fed. During this time, they are fed and attended by one person only. After a month's drilling, they are handed over to boys, who are employed to play to them. Each boy takes a bird; and during these exercises, or rather rehearsals, they are occasionally visited, and always fed, by their old teacher; who, by various motions of the head and mouth, checks or encourages them in their piping, according to their merits: for instance, when they repeat a stave too often, he scowls and blows upon them; and when they proceed correctly he waves his head. They perfectly understand these motions, and by dint of perseverance on the part of the teacher, and attention and practice on theirs, acquire the habit of piping, which never leaves them till death. It is, however, observable, that, though all the bulfinches have the same advantages, as far as teaching goes, and the same power of voice, there are not above five out of a hundred that pipe correctly.

Blumenbach says, 'Both sexes readily learn to whistle tunes, to sing in parts, and even to pronounce words.'

TIT-LARK, &C.

Why do the tit-lark and yellow-hammer sing late?

Because they breed late—the latter very late; and Mr G. White lays it down as a maxim in ornithology, that as long as there is any incubation going on, there is music.

THE BUNTING.

Why is the bunting so destructive in rick-yards?

Because, unlike other birds, which burrow into the stack, the bunting deliberately unroofs the rick, by seizing the end of the straw thatching, and drawing it out to search for any grain the ear might yet contain. Mr Knapp saw a rick of barley thus unroofed, so that the immediate removal of the corn became necessary.

THE CHAFFINCH.

Why are chaffinches, in some parts, called 'twinks' and 'pinks'?

Because of their constant repetition of one note, when alarmed or in danger.

THE CANARY-BIRD.

Why is the Canary-bird so called?

Because it was first brought to Europe from the Canary Islands, about the commencement of the sixteenth century; but has since deviated into many varieties.

THE LINNET.

Why is the linnet among the least solitary of birds?

Because it frequents open commons and gorsy fields, where several pairs, without the least rivalry or contention, will build their nests and rear their offspring in the same neighbourhood. This duty over, the families unite, and form large associations, feeding and moving in company, as one united household; and, resorting to the head of some sunny tree, they will pass hours chattering with each other in a low and gentle note; and they will thus regularly assemble during any occasional bright gleam throughout all the winter season—

And still their voice is song,

which, heard at some little distance, forms a very pleasing concert, innocent and joyous.—*Knapp.*

THE SPARROW.

Why ought sparrows to be protected?

Because a single pair of sparrows, during the time they are feeding their young, will destroy about 4,000 caterpillars weekly.—*Bewick.*—They feed their young also with many winged insects; in London, it is presumed, chiefly with flies.—*Jennings.*

THE NIGHTINGALE.

Why are not nightingales heard in Devonshire and Cornwall?

Because it is presumed that these birds come over to us from the Continent at the narrowest passage, and do not stroll so far westward. The failure of them in Northumberland and Scotland is, of course, attributable to the want of warmth.—*G. White.*

THE DIPPER.

Why is a certain bird called the dipper?

Because it is enabled to sink to the bottom of the water in pools, and walk thereon, like the hippopotamus among quadrupeds.

THE REDBREAST.

Why is it said by Pliny, that the redbreast is only se in winter?

Because the robin loses nearly all the characteristic colour from its breast in the summer, when it moults, and only recovers it on the approach of autumn.—*Knapp.*

Why are redbreasts called autumn songsters?

Because in spring and summer their voices are drowned and lost in the general chorus; in autumn their song becomes distinguishable.—*G. White.*

Why is the robin the last bird that retires in the evening?

Because its fine, large eyes are fitted to receive all, even the weakest, rays of light that appear. The worm is its food too, and few that move upon the surface escape its notice.

Why do redbreasts and wrens, in the winter, haunt out-houses, stables, and barns?

Because they may there find spiders and flies, that have laid themselves up during the cold season.—*G. White.*

THE WHEATEAR.

Why is the wheatear highly prized?

Because, in an unfortunate hour, it has been called the English ortolan, and is pursued as a delicate morsel through all its inland haunts, when hatching and feeding its young, the only period at which it frequents our heaths.—*Knapp.*

THE MARTIN.

Why do house-martins build their nests only in the morning?

Because the work of the nest, chiefly of dirt or loam, may not, while it is soft and green, pull itself down by its own weight, but have sufficient time to harden and dry.—*G. White.*

Why do martins usually build to a north-east or north-west aspect?

Because the heat of the sun may not crack or destroy their nests.—*G. White.*

Why are martins less agile than swallows?

Because their wings and tails are shorter, wherefore they are not capable of such surprising turns, and quick and glancing evolutions, as the swallow.—*G. White.*

Why is the nest of the house-martin so frequently destroyed?

Because, in July and August, when it usually brings out its young, one rainy day, attended with wind, will moisten the earthy nest, the cement then fails, and all the unfledged ones are dashed to the ground; and there are some places to which these poor birds are unfortunately partial, though their nests are annually washed down. The parent birds at times seem aware of the misfortune that awaits them; as, before the calamity is completed, we may observe them, with great anxiety hovering about their nests. —*Knapp.*

THE SWIFT.

Why is the swift so called?

Because it is almost continually on the wing. It eats, drinks, collects materials for its nest, and even propagates on the wing; thus appearing to live in the air more than any other bird, and performing all functions there, save those of sleeping and incubation. In general they feed in a higher district than the other species; a proof that gnats and other insects do also abound to a considerable height in the air; they also range to vast distances; since locomotion is no labour to them, who are endowed with such wonderful powers of wing. Their powers seem to be in proportion to their levers, and their wings are longer in proportion than those of almost any other bird.—*G. White.*

Why are swifts out all day long on wet days?

Because many insects abide high in the air, even in rain, and the feathers of these birds are well preened to resist the wet.—*G. White.*

Why do swifts seldom settle on the ground?

Because, when down, they can hardly rise, on account of the shortness of their legs and the length of their wings; neither can they walk, but only crawl. Their bodies being flat, they can enter a very narrow crevice; and where they cannot pass on their bellies, they will turn up edgewise. — *G. White.*

TURTLE DOVES.

Why are turtle-doves emblematic of faithfulness in love?

Because of their adoption by the poets; — 'as to its highly prized fidelity and chastity, setting aside idle fables, it presents nothing superior to other birds which lead the same mode of life.' — *Blumenbach.*

The turtle-dove is also called the *culver.* Spenser, in a sonnet, has —

> Like as the culver on the bared bough,
> Sits mourning for the absence of her mate.

The cooing of the turtle-dove of the United States sounds very melancholy, but is, nevertheless, joyful — this being, in reality, the notes of its amorous affection.

The dove, in the wild state, breeds twice, but when domesticated, nine or ten times in the year; so that a single couple would, in four years, produce 14,672.

PIGEONS.

Why is the carrier pigeon so called?

Because of the service to which it was formerly applied, particularly in the Levant, of carrying letters. It appears that as soon as young pigeons are hatched, a whitish ash-coloured fluid is secreted in their crop, both in the male and female, in abundance, with which they feed for some time the young before they feed them with grain; so that, though *pigeons' milk* would be considered a solecism, yet this fluid seems to be very like milk in its properties. — *Jennings.*

Why are such numbers of London pigeons lost during the winter?

Because of the slight falcon, which takes up its abode every year, from October and November, until the spring, upon Westminster Abbey, and other churches in the metropolis.

THE RAIL.

Why is the rail, in Germany, called the King of the Quails?

Because it was formerly supposed to head them in their migrations.

Why does a partridge sometimes tumble along before a sportsman?

Because she may draw away the dog from her helpless covey. — *G. White.*

Why is it erroneous to suppose that black game drive away red grouse?

Because the two species require very different kinds of cover, and will never interfere. — *Sir W. Jardine.*

Why are the spurs of cocks of great strength?

Because they are supported in the centre by bone.

Why are the bones of fowls sometimes of a red tint?

Because madder, a plant yielding a red colour, has been mixed with their food. The nature of the food, generally, also exercises a considerable influence over the colour of their bones.

THE PEACOCK.

Why is it improper to call the long feathers of peacocks a tail?

Because the feathers do not grow from the rump, but all up the back. A range of short, brown, stiff feathers, about six inches long, fixed in the rump, is the real tail, and props up the long feathers, or train, which is top-heavy when set on end. By a strong muscular vibration, these birds can make the shafts of their long feathers clatter like the shafts of a sword-dancer. — *G. White.*

Why were peacocks and pheasants the peculiar food of knights?

Because they were said to be the nutriment of lovers, and the viand of worthies. — *Mills.*

Why were the highest honours conferred on peacocks?

Because knights associated them with all their ideas of fame, and vowed by the peacock, as well as by the ladies, to perform their highest enterprises. — *Mills.*

THE HERON.

Why do herons, in flying, seem encumbered with too much sail for their light bodies?

Because of their vast hollow wings, which are necessary in carrying burdens, such as large fishes, &c. — *G. White.*

THE CURLEW.

Why is the stone-curlew so called?

Because, when hatched, the young run immediately from the egg, like partridges, &c; and are withdrawn to some flinty field by the dam, where they skulk among the *stones*, which are their best security; for their feathers are so exactly the colour of our gray spotted flints, that the most exact observer, unless he catches the eye of the young bird, may be eluded. — *G. White.*

WOODCOCKS.

Why do poachers light fires on the coast, to catch woodcocks?

Because woodcocks, migrating during the night, and being attracted by the light, bend their course thither; in which manner great numbers are annually destroyed.

Why are the nests of woodcocks and fieldfares so rarely found in England?

Because those birds leave us in the spring, in order to cross the seas, and to retire to some districts more suitable to the purpose of breeding. 'That the former pair before they retire,' observes Mr White, 'and that the hens are forward with egg, I myself, when I was a sportsman, have often experienced.' — *Nat. Hist. of Selborne.*

THE RUFF.

Why is a certain bird called 'the Ruff'?

Because the neck and ear feathers are much produced in the breeding season, in the males, the heads of which are in part naked. — *Fleming.*

THE PETREL.

Why were petrels, in past times, thought to predict a storm?

Because they seem to repose in a common breeze, but, upon the approach, or during the continuation, of a gale, they surround a ship, and catch up the small animals which the agitated ocean brings near the surface, or any food that may be dropped from the vessel. Whisking like an arrow through the deep valleys of the abyss, and darting away over the foaming crest of some mountain wave, they attend the labouring bark in all her perilous course. When the storm subsides, they retire to rest, and are no more seen. Our sailors have, from very early times, called these birds 'Mother Cary's Chickens.' — *Knapp.*

The inhabitants of the Faroe islands use them as lamps: they pass a wick through their bodies, which, when lighted, burns a long time, from the quantity of fat they contain. — *Blumenbach.*

THE SWAN.

Why has the swan the epithet of mute?

Because it utters no sound except its hissing.

Why has a 'Swan with Two Necks' been adopted as a tavern-sign?

Because, it appears, from the roll of swan's marks in the time of Henry VIII, that the king's swans were *double* marked, and had what were called *two nicks*, or notches. The term, in process of time, not being understood, a double animal was invented, with the name of the 'Swan with Two *Necks*.' — *The Mirror*, 1828.

Why are certain civic excursions on the Thames called 'swan-hopping'?

Because of its corruption from swan-*upping*, or the taking-up of swans, performed annually by the swan companies, with the Lord Mayor at their head, for the purpose of marking the birds. — *The Mirror*, 1828.

Why is a black swan no longer a proverbial rarity?

Because it is now found in great numbers in Van Diemen's Land, in New South Wales, and on the western coast of New Holland. The latter settlement, Swan River, has been so named from the flocks of black swans on its banks.

DUCKS.

Why is the finest down of the eider-duck called 'live' down?

Because it is found in the nest: that which is plucked from the dead bird is little esteemed.

Eider-down is imported chiefly from Iceland, and other northern countries. It is collected from the nests of birds; if the nest be deprived of its down, the female takes a fresh quantity from her breast; but, if the nest be a second time deprived of its down, she cannot supply it: the male then takes from his breast the necessary lining.—*Selby*.

Why have the bills of ducks a soft covering?

Because it supplies them with a real sense of taste; this covering being supplied with exceedingly large cutaneous nerves. Accordingly, it is easy to remark the manner in which ducks *probe*, as it were, the puddles, in search of their food, where they cannot be guided by their sight or smell.—*Blumenbach*.

Why do the wedge-like forms of flocks of wild-geese so often change during their flight?

Because, it is conjectured, of the leader of the van quitting his post at the point of the angle through fatigue, and leaving his place to be filled by another, himself dropping into the rear.

Why is the pied oyster-catcher so called?

Because it feeds on oysters and limpets, and its bill is so well adapted to force asunder the valves of the one, and of raising the other from the rock, that 'the Author of nature,' as Derham says, 'seems to have framed it purely for that use.'

FOREIGN BIRDS.

Why has it been thought that the tropical regions are deficient in birds of song?

Because, from the abundance of the *picæ* tribe, such as parrots, and some others of harsh note, it is probable that their sounds, in the tropical woods, often overpower and confound the more soft and sweet modulations of the warbler tribe. Still, it is a very unfounded notion that in the New World the brilliant hues of the birds take the place of the power of song. On the contrary, it would appear, from Wilson's *American Ornithology*, that the American song-birds are infinitely more numerous than those of Europe, and many of them superior to our most celebrated songsters.

VULTURES.

Why was the vulture held sacred by the Egyptians?

Because it was extremely serviceable in destroying mice, lizards, &c; whence they have frequently represented it in the hieroglyphics on their obelisks, the coverings of their mummies, &c. — *Blumenbach.*

Why is a certain species called 'the King of the vultures'?

Because it has been placed at the head of the vulture tribe, on account of the superior beauty of its external appearance. Waterton, a recent traveller, asserts, that when *the king of the vultures* is present, the inferior species do not attempt to touch the prey till *the king* is satisfied.

Why are marine shells to be found buried in the plains, or in the sides of the mountains, of South Africa?

Because they have been carried there by birds, and not, as has been generally supposed, by eruptions of the sea. Mr Barrow, who is of this opinion, tells us, in confirmation of it, that 'there is scarcely a sheltered cavern in the sides of the mountains that rise immediately from the sea, where living shell-fish may not be found any day in the year. Crows even, and vultures, as well as aquatic birds, detach the shell-fish from the rocks, and mount with them into the air: shells, thus carried, are said to be frequently found on the very summit of the Table Mountain. In one cavern, at the point of Mussel Bay,' he adds, 'I disturbed some thousands of birds, and found as many thousands of living shell-fish, scattered on the surface of a heap of shells, that, for aught I know, would have filled as many thousand wagons.' The story, therefore, of the ancient philosopher, whose bald pate one of these unlucky birds mistook for a stone, and dropped a shell upon, thereby killing at once both fish and philosopher, is not so tramontane as to stumble all belief.

PARROTS.

Why have parrots, in general, striking peculiarities in their manners?

Because they have the power of using their feet almost like hands; as for carrying food to their mouths, scratching behind their heads, &c. When they walk on the ground, they tread not merely on the claws, like other birds, but on the whole of the foot. Their hookshaped upper mandible is articulated, very moveable, and serves the purpose of a third foot in climbing.

Why is the Guinea parrot, in French, called 'l'inséparable'?

Because it has been said, but untruly, that they must always be kept in pairs, a single one not surviving the loss of its mate.

Why are many families of parrots found only in districts of very limited extent?

Because their wings are short, and unfitted for long flights. This is, at least, one cause. In the Philippines, for instance, many families of parrots are confined to particular islands, and never met with on others lying in the immediate vicinity.—*Blumenbach.*

THE TOUCAN.

Why is the toucan also called the 'Egg-sucker'?

Because it chiefly feeds on the eggs found in other birds' nests.

Why has the toucan a broad and long bill, covered with branches of nerves?

Because the nests in which it finds its food are often very deep and dark, and this provision enables the bird to feel its way as accurately as the finest and most delicate finger could.

WOODPECKER.

Why is the downy wood-pecker so destructive to the orchards of North America?

Because it makes one hole close to another, in a horizontal line, till it has completed a circle of holes all round the tree.

RED-CREEPER.

Why is the hook-billed red-creeper so highly-prized in the Sandwich Isles?

Because the ingenious natives manufacture various articles of ornament and dress, as helmets, and even entire mantles, with its carmine red feathers.

HUMMING-BIRD.

Why are humming-birds so called?

Because they are almost continually on the wing, fluttering like bees, and making a humming noise. They are so small as to be worn as ear-rings by the Indian ladies. When dried, the least of them weigh only about twenty grains each. The nest is of cotton, and about the size of a walnut, with two eggs about as big as peas.

AMERICAN CROW.

Why does the carrion-crow of America differ materially from the bird so common in England?

Because of its greater rapacity as well as tameness. Thus, in the cities where they are protected, they enter the very kitchen, and feed on whatever is thrown to them, even vegetables. If unmolested they will remain in the same premises for months, flying to the roof at dusk to spend the night. Six or seven are often seen standing, in cold weather, round the funnel of a chimney, apparently enjoying the heat from the smoke. Notwithstanding the penalties imposed by law, a number of these birds are destroyed on account of their audacious pilfering. They seize young pigs as great dainties. They watch the cackling hen, in order to get the fresh egg from her nest; and they will not hesitate to swallow a brood of young ducks. In order to keep them from the roofs of houses, where their dung is detrimental, the inhabitants guard the top with broken pieces of glass fastened in mortar; and they often kill them by throwing boiling water upon them. No fewer than two hundred of these birds are daily fed by the city of Natchez.—*Audubon.*

BIRD OF PARADISE.

Why were birds of paradise formerly thought to be without feet?

Because they were and are worn as ornaments in

India, on account of their beautiful plumage; and when sold for this purpose, the Passous still *cut off the feet.* — *Blumenbach.*

INDICATOR.

Why is the indicator also called the 'honey-cuckoo'?

Because, like the honey-bear,* it obtains its food from the nests of the wild bees.

Why is the indicator protected by the Hottentots?

Because, by its notes, it is said to conduct them to the nests of the wild bees.

LOXIA.

Why is the pensile loxia of the Cape and Madagascar so called?

Because it builds a remarkable nest, in the vicinity of water, in shape almost like a retort, with a depending neck for ingress and egress, and so disposed that the aperture is close to the water. — *Blumenbach.*

Why do many birds of warm climates build pendulous nests, which are attached to the extreme branches of trees?

Because there only are they secure from their enemies, the snakes and monkeys.

MOCKING-BIRD.

Why is the mocking-bird so called?

Because, in addition to the fulness and melody of his original notes, he has the faculty of imitating the notes of all other birds, from the humming-bird to the eagle. In measure and accent he faithfully follows his originals, while in force and sweetness of expression he greatly improves upon them. A bystander might suppose that the whole feathered tribes had assembled together on a trial of skill, each striving to produce his utmost effect, so perfect are his imitations. He often deceives the sportsman, and even birds themselves are sometimes imposed upon by this admirable music. In confinement he loses little of the power or energy of his song. He whistles for the dog :. Cæsar starts up, wags his tail, and runs to meet his master. He cries like a hurt chicken, and the hen hurries about, with feathers on end, to protect her injured brood. He repeats the tune taught him, though it be of considerable length, with great accuracy. He runs over the notes of the canary, and of the red-bird, with such superior execution and effect, that the mortified songsters confess his triumph by their silence. His fondness for variety some suppose to injure his song. His imitations of the brown thrush are often interrupted by the crowing of cocks ; and his exquisite warblings after the blue-bird, are mingled with the screaming of swallows, or the cackling of hens. During moonlight, both in the wild and tame state, he sings the whole night long. The hunters, in their night excursions, know that the moon is rising the instant they begin to hear his delightful solo. — *Rennie.*

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* See Quadrupeds, p. 18.

Mr Southey, in his notes to *Madoc*, says, ‘ A negress was once heard to exclaim, ‘ Please God Almighty, how sweet that mocking-bird sing ! he never tire.’ By day and night it sings alike ; when weary of mocking others, the bird takes up its own natural strain, and so joyous a creature is it, that it will jump and dance to its own music. This bird is perfectly domestic, the Americans holding it sacred. Would that we had more of these humane prejudices in England, if that word may be applied to a feeling so good in itself, and in its tendency.’

SNOW-BUNTING.

Why is the snow-bunting so called ?

Because it is the only living creature that is found at the height of 2000 feet above the limit of perpetual snow. The snow-finch is found on Caucasus and the European Alps.

FLY-CATCHER.

Why is the red-eyed fly-catcher in the West Indies called 'Tom Kelly'?

Because his notes are in short emphatic bars of two, three, or four syllables; and on listening to his song, you may fancy you hear the words, 'Tom Kelly! whip! Tom Kelly!' very distinctly. -- *Rennie.*

TAILOR-BIRD.

Why is the tailor-bird so called?

Because of the art with which it makes its nest;—sewing some dry-leaves to a green one at the extremity of a twig, and thus forming a hollow cone, which it afterwards lines with feathers. It is found in India, and is smaller than a wren. — *Blumenbach.*

GULL-TEAZER.

Why is the sea-swallow also called 'the gull teazer'?

Because it is frequently seen to pursue and persecute the lesser gulls, till they disgorge their food, which it dexterously catches before it reaches the water.

AMERICAN PIGEON.

Why are the wild pigeons of America so celebrated?

Because of their great power of flight, which enables them, when in need, to survey and pass over an astonishing extent of country in a very short time. This is proved by facts known to the greater number of observers in America. Pigeons, for example, have been killed in the neighbourhood of New York, with their crops still filled with rice, collected by them in the fields of Georgia and Carolina, the nearest point at which this supply could possibly have been obtained; and as it is well ascertained, that, owing to their great power of digestion, they will decompose food entirely in twelve hours, they must have travelled between 300 and 400 miles in six hours, making their speed at an average of about one mile in a minute; and this would enable one of these birds, if so inclined, to visit the European continent, as swallows undoubtedly are able to do in a couple of days.

Such are their numbers, that the air is described as 'literally filled with pigeons; the light of the noon-day becomes dim, as during an eclipse.'

It may not, perhaps, be out of place to attempt an estimate of the number of pigeons contained in one of those mighty flocks, and the quantity of food daily consumed by its members. The inquiry will show the astonishing bounty of the Creator in his works, and how universally this bounty has been granted to every living thing on the vast continent of America.

We shall take, for example, a column of one mile in breadth, which is far below the average size, and suppose it passing over us without interruption for three hours, at the rate mentioned above, of one mile per minute. This will give us a parallelogram of 180 miles by 1, covering 180 square miles; and allowing two pigeons to the square yard, we have 1,115,136,000 pigeons in one flock; and as every pigeon consumes fully half-a-pint of food per day, the quantity must be 8,712,000 bushels per day, which is required to feed such a flock. —*Audubon.*

THE WHIP-POOR-WILL.

Why is a certain American bird called the 'Whip-poor-Will'?

Because its notes seem pretty plainly to articulate the words *whip-poor-will;* the first and last syllables being uttered with great emphasis, and the whole in about a second to each repetition; but when two or more males meet, their whip-poor-will altercations become much more rapid and incessant, as if each was straining to overpower or silence the other.

On or about the 25th of April, if the season be not uncommonly cold, the whip-poor-will is heard in Pennsylvania, in the evening, as the dusk of twilight commences; or in the morning, as soon as the dawn has broke. The notes of this solitary bird, from the ideas which are naturally associated with them, seem like the voice of an old friend, and are listened to by almost all with great interest. At first they issue from some retired part of the woods, the glen, or mountain; in a few evenings, perhaps, we hear them from the adjoining coppice, the garden fence, the road before the door, and even the roof of the dwelling-house, — hours after the family have retired to rest. Some of the more ignorant and superstitious consider this near approach as foreboding no good to the family, — nothing less than the sickness, misfortune, or death, of some of its members. Every morning and evening his shrill and rapid repetitions are heard from the adjoining woods; and when two or more are calling at the same time, as is often the case in the pairing season, and at no great distance from each other, the noise, mingling with the echoes from the mountains, is really surprising. Strangers, in parts of the country where these birds are numerous, find it almost impossible for some time to sleep; while, to those acquainted with them, the sound often serves as a lullaby, to assist their repose. Towards midnight they generally become silent, unless in clear moonlight, when they are heard with little interruption till morning. — *Rennie.*

This is one of the goat-suckers, which are chiefly American birds. The European species has been mentioned at p. 102. Besides the whip-poor-will, Waterton mentions four kinds that have each a peculiar set of notes. One utters, 'Who are you, who, who, who are are?' another, 'work away, work, work away;' another, 'Willy come go;' and another, a large bird, the size of the English wood-owl, 'Ha, ha, ha, ha, ha, ha, ha ;' which sounds are uttered like a person in deep distress, — the departed voice of a night-murdered victim. The plaintive cries of all these are uttered throughout the night.

NEGRO-FOWL.

Why is the negro-fowl so called?

Because it has a black skin. It is principally from St Jago, in the Cape de Verd Islands, where other species of birds are said to present the same peculiarity. — *Blumenbach.*

CURASSOW.

Why is the curassow improperly so called?

Because it has been corrupted from Curaçoa, the name of an island where the bird is found in great abundance.

THE OSTRICH.

Why is the ostrich enabled to run with such celerity?

Because his bones, like those of other birds, are hollow; he has also air vesicles similar to other birds, which, notwithstanding he cannot leave the earth, enable him, by the assistance of his muscular legs, to run with astonishing swiftness.

Why do the feathers of the ostrich differ from those of other birds?

Because they have their shaft exactly in the middle, whereas the feathers of other birds have the webs broader on one side than the other.

Why does the ostrich lay and hatch her eggs in the sand?

Because her form being ill-adapted to that process, she has a natural oven furnished by the sand, and the strong heat of the sun.

Why has the ostrich been so long known for its stupidity?

Because of its mention in the book of Job, xxix, 16, 17: 'She is hardened against the young ones, as though they were not hers: Because God hath deprived her of wisdom, neither hath he imparted to her understanding.'

Some accounts exonerate the ostrich from being the most stupid bird in the creation. This has been proved by the experiment of taking an egg away, or by putting one in addition. In either case she destroys the whole by smashing them with her feet. Although she does not attend to secrecy in selecting a situation for her nest, she will forsake it if the eggs have been handled. It is also said that she rolls a few eggs thirty yards from the nest, and cracks the shells, which, by the time her young come forth, being filled with maggots, and covered with insects, form the first repast of her infant brood. The male bird is said to take upon himself the rearing of the young. If two cock birds meet, each with a family, they fight for the supremacy over both; for which reason an ostrich has sometimes under his tutelage, broods of different ages. — *General Miller.*

Each of the ostrich's eggs, of which it lays about thirty, contains as much as twenty-four hen's eggs.

Why are young ostriches seldom domesticated, although they soon become attached to those who caress them?

Because they are troublesome inmates: for, stalking about the house, they will, when full grown, swallow coin, shirt-pins, and every small article of metal within their reach.

CASSOWARY.

Why is the New Holland cassowary hunted?

Because it abounds with oil, which is used for leather, &c. Its flesh, when cooked, more resembles beef than fowl. It is hunted with dogs, the scull, or the jaw of which, according to Wentworth, it sometimes fractures by a single kick. A fine pair of these birds may be seen in the gardens of the Zoological Society.

SPOONBILL.

Why is the spoonbill so called?

Because of its singular bill having the shape of a *spoon*. Its singularity does not, however, consist merely in its shape, but also in its structure: for it is not hard, like the beaks of other birds, but soft and flexible like leather. — *Jennings.*

HORNED SCREAMER.

Why has the horned screamer two spurs on each wing?

Because it may defend itself against some noxious animals which infest the native regions of this bird — the fenny and marshy parts of South America. Notwithstanding this armour it is said that this bird is the most gentle of all animals; that the male and female are always found in pairs, and that, if one dies, the other does not long survive.

BITTERN.

Why does the great American bittern emit a strong light from its breast?

Because the light, which is equal to that of a common torch, may illuminate the water, so as to enable the bird to discover its prey. —*American Naturalist.*

IBIS.

Why was the ibis so famed among the ancient Egyptians.?

Because it was the symbol of the overflowing of the Nile, from its arrival, breeding season, and departure, coinciding with the commencement, &c, of the fertilizing inundation of that river.

It has been frequently represented on their hieroglyphical monuments, and prepared, like the human bodies, in the form of mummies, great numbers being placed in certain vaults. At present it is rather uncommon, at least in Lower Egypt. — *Blumenbach.*

TRUMPETER.

Why is the trumpeter so called?

Because of its harsh, uncommon cry, not unlike a child's trumpet, with which it follows people through the streets, in Brazil and Guinea, so that it is difficult to get rid of it. — *Waterton.*

DARTER.

Why is the darter of Brazil so called?

Because it has a very long neck, which the animal can roll up spirally, and by that means dart its head at the fish it wishes to seize.

TROPIC BIRD.

Why is the tropic bird so called?

Because it lives in the open seas between the tropics, chiefly on the flying fish.

HORNBILLS.

Why is the flesh of the Indian hornbill peculiarly aromatic?

Because it feeds on wild nutmegs, which grow abundantly in its native place, the Molucca Islands.

Why is another species of the above-mentioned bird called the jealous hornbill?

Because he feeds the female during her incubation; and, during his absence in search of food, should he find on his return, the marks of another bird near the nest, he will, it is said, inclose the female in the nest, and leave her to perish. — *Horsfield.*

SOCIABLE NEST.

Why is the sociable grossbeak so called?

Because it lives in vast tribes, from 800 to 1000 at times, under one common roof, containing their several nests, which are built on a large species of mimosa.

INDIAN GROSSBEAK.

Why is it popularly believed in India that the baya, or grossbeak lights the chambers of his nest with fire-

flies, which he catches alive at night, and confines with moist clay or cow-dung?

Because such flies are often found in his nest, where pieces of cow-dung are also stuck; but, as their light could be of little service to him, it seems probable that he only feeds on them.

FAITHFUL JACANA.

Why has the jacana the epithet of 'faithful?'

Because it is kept by the natives of South America to wander with the poultry, and defend them from birds of prey, which it does by the spurs on its wings; it never deserts its charge, but brings them home safely at night.

BELL-BIRD.

Why is the variegated chatterer of South America also called the bell-bird?

Because its voice is, for about six weeks only, in December and January, like the noise of a cracked bell. The carunculated chatterer is also called the bell-bird, from its notes being composed of two syllables—*in an*, uttered in a drawling tone, which (Mr Waterton says) may be heard three miles distant.

SAWING BIRD.

Why is the Chilian sawing bird so called?

Because, with its straight, and serrate, or notched bill, it cuts down fresh vegetables, as with a *saw*.

CAT BIRD.

Why is the cat bird so called?

Because it mews like a cat, or rather, like a young kitten. It also imitates the notes of other birds, and attacks snakes.—*Wilson.*

RICE BIRD.

Why is the rice bird so called?

Because, in Cuba, it is found in great numbers during the season of the rice crop; but no sooner is the rice gathered, than it removes to Carolina, and meets the same harvest in that country, where it remains till the rice season is past.

COOLIES.

Why do coolies differ from other birds?

Because they do not perch, nor leap from branch to branch, nor do they even walk nimbly; for, resting on the whole length of the leg, they drag the belly after them. At the Cape of Good Hope they are called *Mouse Birds*, from their soft plumage, and their frequently creeping about the roots of trees. — *Jennings.*

THE BOOBY.

Why is the booby so called?

Because it is an indolent, senseless, and cowardly bird, submitting to all sorts of depredations upon its happiness with indolent imbecility; yet it is occasionally, when much excited, ferocious. The man-of-war bird no sooner perceives it in the air, than it pounces upon it, not to destroy it, but to make it disgorge the fish which it has swallowed, which is caught by the voracious plunderer before it reaches the water. — *Jennings.*

THE PELICAN.

Why has the pelican a pouch attached to her bill?

Because it answers the purpose of a crop, and is used by the bird to contain food both for herself and her young, which, when hatched, are fed with the fishes that have been for some time macerated in the pouch; this, when distended, will contain ten quarts. Great numbers of pelicans are killed for their pouches, which are converted by the native Americans into purses, &c. When carefully prepared, the membrane is as soft as silk, and sometimes is embroidered by the Spanish ladies for work-bags, &c.

It is used in Egypt by the sailors, whilst attached to the two under chaps, for holding or bailing water.

Why was the pelican formerly thought to feed her young with her blood?

Because, in disgorging the food from the pouch for the young, the bird presses the bottom of the sack upon her breast, and thus the contents are discharged.*

THE CORMORANT.

Why has the cormorant a small sabre-shaped bone at the back of its vertex?

Because this bone may serve as a lever in throwing back the head, when the animal tosses the fishes which it has taken into the air, and catches them in its open mouth. This conjecture is by Blumenbach, who, however, observes, that the same motion is performed by some other piscivorous birds, which are not provided with this particular bone.

Why was the cormorant formerly domesticated in this country?

Because it was trained to fish for its owner; it is still used in China for this purpose.

THE MAN-OF-WAR.

Why is the man-of-war bird so called?

Because it is one of the most formidable tyrants of the ocean. When in flocks, they attack sometimes even man himself. It is said that a cloud of them attacked a crew of French sailors upon the Island of Ascension, and, till some of them were struck down, endeavoured to snatch the meat from their hands. — *Jennings.*

THE ORNITHORYNCUS.

Why is the ornithoryncus said to form the connecting link between the bird and beast?

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* See the Vignette.

Because it has a bill like a duck, and paws webbed similar to that bird, but legs and body like those of a quadruped, covered with thick, close hair, with a broad tail to steer by. It is believed to lay eggs; it bears a claw on the inside of its foot, with a tube therein, through which it emits a poisonous fluid into the wounds which the claw inflicts.*

Why have birds a gizzard?

Because it may answer the purposes of teeth to masticate their food; the gizzard being composed of thick and tough muscular substance, small in size, but more powerful in its action than the strongest jaw-bone. It consists of four distinct muscles—a large hemispherical pair at the sides, and a small pair at the two ends of the cavity. By their alternate action these muscles produce two effects; the one, a constant friction on the contents of the cavity, the other, a pressure upon them. These muscles are lined with a cuticle which is extremely callous, and which often becomes cartilaginous, and even horny. Reaumur and Spallanzani compelled geese and other birds to swallow needles, lancets, and other hard substances; in a few hours after which, the birds were killed and examined;-the needles and lancets were uniformly found broken off and blunted, without the slightest injury having been sustained by the stomach. Swallowing pebbles also aids the action of the gizzard upon the food, the stones in some measure serving the purpose of teeth. Mr Hunter observed that the size of the pebbles is always in proportion to that of the gizzards. In the gizzard of a turkey he counted two hundred; in that of the goose, a thousand.—(*See page* 84.)

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* Cunningham's Sketches of New South Wales.—See also *Quadrupeds*, page 58 of the present volume.

Why does the gastric juice, in its effects, differ in different animals?

Because of the varieties of food on which they subsist. Thus,in birds of prey, as kites, hawks, owls, it only acts upon animal matter, and does not dissolve vegetables. In other birds, and in all animals feeding on grass, it dissolves vegetable matter, as grass, but will not touch flesh of any kind. This has been ascertained by making them swallow balls with meat in them, and several holes drilled through, to let the gastric juice reach the meat: no effect was produced upon it.

We may farther observe that there is a most curious and beautiful correspondence between this juice in the stomach of different animals, and the other parts of their bodies, connected with the important operations of eating and digesting their food. The use of the juice is plainly to convert what they eat into a fluid, from which,by various other processes, all their parts, blood, bones, muscles, &c, are afterwards formed. But the food is first of all to be obtained, and then prepared by bruising, for the action of the juice. Now, birds of prey have instruments, their claws and beak, for tearing and devouring their food, (which is animals of different kinds,) but those instruments are useless for picking up and crushing seeds; accordingly they have a gastric juice which dissolves the animals they eat; while birds which have only a beak fit for pecking, drinking, and eating seeds, have a juice that dissolves seeds, and not flesh. Nay more, it is found, that the seeds must be bruised before the juice will dissolve them:—this is found by making the experiment, in a vessel with the juice; and accordingly, the birds have a gizzard, and animals which graze have flat teeth, which grind and bruise their food before the gastric juice is to act upon it.

Why have some birds more air-cells than others?

Because the quantity of air which they individually contain, is proportioned to the influence which they exert on the locomotion of the body. Thus, in the eagle, and other birds of long flight, the bones which support the wings are filled with air; while in such as the puffin, whose wings are unequal to any lengthened flight, or the ostrich, which prefers to run, air-cells are found in the greatest numbers within the bones of the leg and thigh.

These air-cells generally exist externally, between the muscles: the bones themselves, which in the mammalia contain marrow, are, in birds, filled with air. It has also been observed, by Mr Green, the celebrated anatomist, that, in young birds, a medullary substance is often observable in the bones; but as they grow up to maturity, it becomes absorbed, and the bone empty.

The beauty of this contrivance is equalled only by its importance. Independently of a perfect supply of air being thus furnished at all seasons, for the purposes of respiration, without any inconvenience to the general system, the relative weight of the body is materially diminished, the difficulty of breathing in a very rarefied atmosphere is counteracted, and the necessity of a frequent respiration during rapid flight may be dispensed with.

Why have birds that do not fly wings?

Because they assist in balancing the body as they run.

Why are the necks of aquatic birds proportionally longer than those of land birds?

Because aquatic birds have to seek their food below the surface of the water on which they swim. The length of the neck generally increases in proportion to that of the legs.— *Blumenbach.*

Why does the neck of a bird acquire that double bend which makes it resemble the letter S?

Because the neck joints are not united by plane surfaces, but by cylindrical eminences, which admit of a more extensive motion, as they also constitute real joints. Four or five of the pieces only bend forwards, while the lower ones are confined to flexion backwards. — *Blumenbach.*

Why do birds stretch out their necks when flying?

Because they may become like sharp points, dividing the air, and diminishing the resistance.

Why are the beaks of birds so diversified in their form and structure?

Because each beak is adapted for receiving only certain kinds of food. Thus, some are long and pointed, others are broad and flat; others are hooked and curved.

Why is the freshness of an egg judged by its warmth?

Because the egg, like most other living beings, maintains a temperature considerably above that of the surrounding medium; and, as long as it is alive, it resists putrefaction, under degrees of heat and moisture, which cause it to run rapidly into the putrefactive process as soon as it is dead.

Why, in several species of birds, have the male and female different plumage?

Because, as the female ceases in her old age to lay eggs, she obtains the male plumage. — *Blumenbach.*

Why is the body of a newly hatched bird covered with hair instead of feathers?

Because little tufts of hair, produced from one common bulb, are the rudiment of the future feather. In a few days a black cylinder appears, which opens at the extremity, and gives passage to the feather. The opposite end receives those blood-vessels, which supply the vessel-like substance in the barrel of the feather; when the stalk of the feather has received its complete growth, this vessel-like body is dried up, and presents the well known appearance called pith, in the barrel of quills.

Why are birds considered much less favoured in respect to organs of touch than mammalia?

Because one extremity of their bodies is occupied with the bill, and the other with a sort of oar or rudder. The anterior appendices (or wings) are organs of mere locomotion; and the remaining portion of the body, or the extremities of the posterior appendices, serve to give them a firm position on their two legs. We find, however, that in these animals the toes are more articulated than in mammalia; that they are in a great degree capable of being separated from each other; and the nerves with which they are furnished considerable. It may be inferred, therefore, that the feet of birds would be tolerably perfect organs of touch, if they were not used as organs of locomotion; and that, the less they are used for the latter purpose, the more perfect is the sense of touch. Accordingly, we find that parrots take up their food with their feet, and convey it to their mouths. In birds of prey the sense is probably more acute, as their feet are little used for progression. In the gallinaceous birds, (as fowls) whose feet are constantly on the ground, and in the ostrich and cassowary, which do not fly, the epidermis (or outer skin) is thickened, and its sensibility consequently diminished.—*Lawrence's Notes to Blumenbach's Comparative Anatomy.*

Why is it erroneous to accuse birds of destroying the buds of trees in spring?

Because it is not the buds, but the insects frequenting them, of which the birds are in search.

Why are the banks of the Demerara so attractive to ornithologists?

Because the birds there are unrivalled in beauty, the birds of Cayenne excepted. Thus, in passing up the river, every now and then, the maam, or tinamou, sends forth one long plaintive whistle, from the depths of the forest, and then stops; whilst the yelping of the toucan, and the shrill voice of the bird called pi-pi-yo, are heard during the interval. The campanero never fails to attract the attention of the passenger; at a distance of nearly three miles, you may hear this snow-white bird tolling every four or five minutes, like the distant convent-bell. From six to nine in the morning, the forests resound with the mingled cries and strains of the feathered race: after this they gradually die away. From eleven to three all nature is hushed, as in a midnight silence, and scarce a note is heard, save that of the campanero and pi-pi-yo; it is then that, oppressed by the solar heat, the birds retire to the thickest shade, and wait for the refreshing cool of evening. At sundown, goatsuckers skim along the trees on the river's bank, and, with owls, lament and mourn all night long. The houtou, a solitary bird, and only found in the thickest recesses of the forest, distinctly articulates 'houtou, houtou,' in a low and plaintive voice, an hour before sunrise; the maam whistles about the same hour; the hannaquoi, pataca, and maroudi, announce the sun's near approach to the eastern horizon; and the parrots and paroquets confirm his arrival there. —*Abridged from Waterton's Wanderings.*

Why are falcons distinguished as noble and ignoble?

Because the *noble* falcons seize their prey in the air during flight; for they never devour what has been killed or wounded by other birds; they must drink the blood of their victims warm or not at all. In all these birds the bill is very short, strong, and much hooked. The *ignoble* are inferior in many respects; the tooth of their bills is rounded off, and does not present an acute angle; while the wings are proportionally short, and consequently weaker. This second grand division of rapacious birds, is seldom, if ever, used in falconry.

These definitions are by a correspondent of the *Magazine of Natural History*, Vol. I. Another writer in that work thinks the term *noble* to have been applied, not to all such as take their prey in the air,— which definition would, he thinks, improperly exclude the eagles; these birds, according to Temminck and Montagu, pouncing their prey on the wing,—but to have been used to denote such as were used in falconry only, which was formerly the sport only of princes and *noble* persons.

Why are the gardens in and about London much more injured by insects, than those in comparatively distant parts of the country?

Because, partly, of the smaller number of insectivorous birds in and about the metropolis; and their scarcity is not, as frequently alleged, owing to the smoke, the number of houses, and the want of trees and food, because it is well known that every kind of bird will live, and thrive in cages in the heart of London — but to the number of bird-catchers, and, in some respect, the cats.

END OF PART IV.

KNOWLEDGE FOR THE PEOPLE:

OR THE

PLAIN WHY AND BECAUSE.

PART V.—POPULAR CHEMISTRY.

POPULAR CHEMISTRY.

INTRODUCTORY.

Why is the science of chemistry so named?

Because of its origin from the Arabic, in which language it signifies "the knowledge of the composition of bodies."

The following definitions of chemistry have been given by some of our best writers:—

"Chemistry is the study of the effects of heat and mixture, with the view of discovering their general and subordinate laws, and of improving the useful arts." —*Dr. Black.*

"Chemistry is that science which examines the constituent parts of bodies, with reference to their nature, proportions, and method of combination."—*Bergman.*

"Chemistry is that science which treats of those events or changes, in natural bodies, which are not accompanied by sensible motions."—*Dr. Thompson.*

"Chemistry is a science by which we become acquainted with the intimate and reciprocal action of all the bodies in nature upon each other."—*Fourcroy.*

The four preceding definitions are quoted by Mr. Parkes, in his *Chemical Catechism.*

Dr. Johnson (from Arbuthnot) defines "chemistry" as "philosophy by fire."

Mr. Brande says "It is the object of chemistry to investigate all changes in the constitution of matter, whether effected by heat, mixture, or other means."—*Manual*, 3rd edit. 1830.

Dr. Ure says "Chemistry may be defined the science which investigates the composition of material substances, and the permanent changes of constitution which their mutual actions produce."—*Dictionary*, edit. 1830.

Sir Humphry Davy, in his posthumous work,* says, "There is nothing more difficult than a good definition of chemistry; for it is scarcely possible to express, in a few words, the abstracted view of an infinite variety of facts. Dr. Black has defined chemistry to be that science which treats of the changes produced in bodies by motions of their ultimate particles or atoms: but this definition is hypothetical; for the ultimate particles or atoms are mere creations of the imagination. I will give you a definition which will have the merit of novelty, and which is probably general in its application. *Chemistry relates to those operations by which the intimate nature of bodies is changed, or by which they acquire new properties.* This definition will not only apply to the effects of mixture, but to the phenomena of electricity, and, in short, to all the changes which do not merely depend upon the motion or division of masses of matter."

Cuvier, in one of a series of lectures, delivered at Paris, in the Spring of last year, says "the name chemistry, itself, comes from the word *chim*, which was the ancient name of Egypt;" and he states that minerals were known to the Egyptians "not only by their external characters, but also by what we at the present day call their *chemical characters*." He also adds, that what was afterwards called the Egyptian science, the

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* Consolations in Travel; or the Last Days of a Philosopher. 1830.

Hermetic art, the art of transmuting metals, was a mere reverie of the middle ages, utterly unknown to antiquity. "The pretended books of Hermes are evidently supposititious, and were written by the Greeks of the lower Empire."

Why is chemistry essential to man in his highest state of cultivation?

Because every part of his body is covered with the products of different chemical and mechanical arts; made not only useful in protecting him from the inclemency of the seasons, but combined in forms of beauty and variety; creating out of the dust of the earth, from the clay under his feet, instruments of use and ornament; extracting metals from the rude ore, and giving to them a hundred different shapes for a thousand different purposes; selecting and improving the vegetable productions with which he covers the earth; making the winds carry him on every part of the immense ocean; and compelling the elements of air, water, and even fire, as it were, to labour for him; concentrating in small space materials which act as the thunderbolt, and directing their energies so as to destroy at immense distances; blasting the rock, removing the mountain, carrying water from the valley to the hill, &c. Or, to be more minute, the rendering skins insoluble in water, by combining with them the astringent principle of certain vegetables, is a chemical invention; and without leather, our shoes, our carriages, our equipages, would be very ill made: the bleaching and dyeing of wool and silk, cotton and flax, are chemical processes, and the conversion of them into different clothes, is a mechanical invention; the working of iron, copper, tin, lead, and the other metals, and the combining them in different alloys, by which almost all the instruments necessary for the turner, the joiner, the stonemason, the shipbuilder, and the smith, are made, are chemical inventions; even *the press* could not have existed in any state of perfection without a metallic alloy. The combining of alkali and sand, and certain clays and flints together, to form glass and porcelain, is a chemical process;* the colours which the artist employs to frame resemblances of natural objects, or to create combinations more beautiful than ever existed in nature, are derived from chemistry;—in short, in every branch of the common and fine arts, in every department of human industry, the influence of this science is felt; and we may find in the fable of Prometheus taking the flame from heaven to animate his man of clay, an emblem of the effects of fire, in its application to chemical purposes, in creating the activity and almost the life of civil society.—*Abridged from "the Last Days of a Philosopher," by the late Sir Humphry Davy.*

Why may real philosophers be considered to have done much by their own inventions for the useful arts?

Because the chemical or mechanical manufacturer has merely applied what the philosopher has made known; he has merely worked upon the materials furnished to him. Thus, the chlorine, or oxymuriatic gas, of Scheele, was scarcely known, before it was applied by Berthollet to bleaching; scarcely was muriatic gas discovered by Priestley, when Guyton de Morveau used it for destroying contagion. Platinum has owed its existence, as a useful metal, entirely to the labours of an illustrious chemical philosopher; look at the beautiful yellow afforded by one of the new metals, chrome; consider the medical effects of iodine, in some of the most painful and disgusting maladies belonging to human nature, as cancer and bronchocele. We have no history of the manner in which iron was rendered malleable; but we know that platinum could only have been worked by a person of the most refined chemical resources.—*Sir H. Davy.*

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* The improvements of porcelain in this country, as well as those made in Germany and France, have been entirely the result of chemical experiments; the Dresden and the Sèvres manufactories have been the work of men of science; and it was by multiplying his chemical researches, that Wedgewood was enabled to produce, at so cheap a rate, those beautiful imitations, which, while they surpass the ancient vases in solidity and perfection of material, equal them in the elegance, variety, and tasteful arrangement of their forms.

Why is the apparatus essential to the modern chemist much less bulky and expensive than that used by the ancients?

Because an air-pump, an electrical machine, a voltaic battery, (all upon a small scale) a blowpipe apparatus, a bellows and forge, a mercurial and water-gas apparatus, cups and basins of platinum and glass, and the common re-agents of chemistry, are all that are required. All the implements absolutely necessary, may be carried in a small trunk; and some of the best and most refined researches of modern chemists, have been made by an apparatus which might with ease be contained in a small travelling carriage, and the expense of which is only a few pounds. Chemistry is not injurious to the health; the modern chemist is not like the ancient one, who passed the greater part of his time exposed to the heat and smoke of a furnace, and the unwholesome vapours of acids and alkalies, and other menstrua, of which, for a single experiment, he consumed several pounds.—*Sir H. Davy.*

ATTRACTION OR AFFINITY.

Why is our earth a globe?

Because of the general attraction by which all its parts are drawn towards each other, that is, towards a common centre; by which means the mass assumes the spherical or rounded form.

We have interesting instances of roundness from the same cause in minute masses,—as the particles of a mist or fog floating in air,—there, mutually attracting and coalescing into larger drops, and then forming rain—dew-drops—water trickling on a duck's wing—the tear dropping from the cheek—drops of laudanum—globules of mercury, like pure silver beads, coalescing when near, and forming larger ones—melted lead allowed to rain down from an elevated sieve, which, by cooling as it descends, retains the form of its liquid drops, and becomes the spherical shot-lead of the sportsman.—*Arnott.*

Why is the prescription of medicine by drops an unsafe method?

Because, not only do drops of fluid from the same vessel, and often of the same fluid of different vessels, differ in size, but also drops of the same fluid, to the extent of a third, from different parts of the lip of the same vessel.

Why has it been said that the whole world, if the atoms could be brought into absolute contact, might be compressed into a nutshell?

Because of the exceedingly little of really solid matter even in the densest mass, as evident in the non-contact of atoms, even in the most solid parts of bodies; from the very great space obviously occupied by pores; the mass often having no more solidity than a heap of empty boxes, of which the apparently solid parts may still be as porous in a second degree, and so on; and from the great readiness with which light passes in all directions through dense bodies, like glass, rock crystal, diamond, &c. We have as yet no means of ascertaining exactly what relation this idea has to truth.—*Arnott.*

Why may the doctrine of ultimate atoms be considered as established?

Because, according to the late Dr. Wollaston, the earth's atmosphere is limited, and consequently matter has a finite divisibility. "Yet," observes another, "of the smallest atom we can always imagine the half."

Why is the density, or the quantity of atoms which exist in a given space, very different in different bodies?

Because of three different circumstances: first, of the size or weight of the individual atoms; secondly, on the degree of porosity just now explained; thirdly, on the proximity of the atoms in the more solid parts, which stand between the pores. As an example of the different degrees of density, a cubic inch of lead is 40 times heavier than the same bulk of cork.—*Arnott.*

Why are certain bodies solid?

Because their parts cohere so firmly as to resist impression.

Lavoisier has explained solidity thus:—"The particles of all bodies may be considered as subject to the action of two opposite powers, repulsion and attraction, between which they remain in equilibrio. So long as the attractive force remains stronger, the body must continue in a state of solidity; but if, on the contrary, heat has so far removed these particles from each other, as to place them beyond the sphere of attraction, they lose the cohesion which they before had with each other, and the body ceases to be solid."

Why do blue and yellow powders, when mixed, form a green powder?

Because of the mere effect arising in the eye from the intimate mixture of the yellow and blue light separately and independently, reflected from the minute particles of each; and the proof is had by examining the mixture with a microscope, when the yellow and blue grains will be seen separately and quite unaltered. —*J. F. W. Herschel.*

Why cannot a similar separation be detected in liquid green?

Because of the excessive minuteness of the parts, and their perfect intermixture, by agitating the blue and yellow liquids together. From the mixture of two powders, extreme patience would enable any one, by picking out with a magnifier grain after grain, to separate the ingredients. But when liquids are mixed, no mechanical separation is any longer practicable: the particles are all so minute as to elude all search —*J. F. W. Herschel.*

Why do we use the term specific gravity to express the relative weight of bodies?

Because it denotes the weight of the matter of which any body is composed, compared with the weight of pure distilled water, at 60° Fahrenheit, assumed as a standard.

Why is there a difference in the specific gravity of different bodies?

Because one body is larger, or takes up more room than another of the same weight, when the first is said to be *specifically* lighter than the other, and *vice versâ.*

The specific gravity of bodies is denoted, in chemical writings, by comparing it with the specific gravity of pure water, in decimal figures, water being always considered as 1.000. Thus the *specific gravity* of the strongest sulphuric acid is 1.850, or nearly nine tenths heavier than water. Iron is 7.650, or more than 7½ times heavier than water; that is, a cubic inch of iron, if put into a scale, would require 7½ inches to balance it; silver is 10.478; gold, 19.300; and platinum, 23.000, or 23 times heavier than water. The specific gravity of all bodies is noted in the same way.—*Parkes.*

Why does some stone decay rapidly, although very hard when first dug from the quarry?

Because it abounds with clay, or alumine, which has so great an affinity for water as to absorb moisture from the atmosphere, and thus destroy itself.

Why will not oil and water mix in a vial upon being violently shaken?

Because the water and the oil have no *affinity* for each other; but if some caustic ammonia be added, and the vial then agitated, the whole will be mixed into an ammoniacal soap. This is what is called *disposing affinity*, or uniting bodies, which apparently have no tendency to unite of themselves, by the addition of another substance.

Why do small needles float on water?

Because the particles of water cohere among themselves, and the weight of the needles is not sufficient to overcome that cohesion.

Why do a pound of water, and a pound of salt when mixed, form two pounds of brine, but then occupy much less bulk than when separate?

Because the atoms of the one are partially received into what were vacant spaces in the other. A similar condensation is observed in many other mixtures; as a pound of sugar in a pound of water. Tin and copper, melted together to form bronze, occupy less space by one fifteenth, than they do when separate.—*Arnott.*

Why are a hundred pints of common air to be compressed into a pint vessel, as in the chamber of an airgun?

Because, in aeriform masses, the atoms are very distant, and hence the masses are more easily compressed. In this case, if the pressure be much further increased, the atoms will at last collapse, and form an oily liquid. The heat which was contained in such air, and gave it its form, is squeezed out in this operation, and becomes sensible all around.—*Arnott.*

Why are liquids said to be saturated?

Because they cannot combine with, or take up, more than a certain quantity of any solid or aëriform body; the point at which this action ceases is *saturation:* thus, water will only take up a certain known weight of alum, salt, &c.

Why is gravitation the first and most general cause of changes on the earth?

Because water, raised in vapour by the heat of the sun, is precipitated by the cool air in the atmosphere; it is carried down by gravitation to the surface; and gains its mechanical force by this law.— *Sir H. Davy.*

Why does the pyramid last longer than other forms?

Because it is most fitted to resist the force of gravitation.

Why is an apartment never literally empty?

Because, if it offer to view nothing but the naked walls, it is full of air, just as an open vessel, immersed in the sea, is full of water; and if air were not allowed to escape from it, even so small a body as an apple could not be pressed into it additionally by less force than fifty or sixty pounds.

Why is heat produced on slacking quick-lime?

Because of the violence of the chemical action, and the solidification of the water. In this process 68 parts of lime solidify 32 parts of water; but it is remarkable, that in making what we call lime-water, 500 parts of water are required to dissolve one part of lime.

Why is it a vulgar error to say quick-lime, or oil of vitriol, burns?

Because they powerfully corrode animal and vegetable substances, and become violently hot from their combination with water. "They are, therefore, set down in vulgar parlance, as substances of a hot nature; whereas, in their relations to the physical cause of heat, they agree with the generality of bodies similarly constituted." They owe the sensation of heat which they excite, to chemical stimulants, and not at all to their being actually hot.

Why are not bitter and sweet essential qualities of matter?

Because, as Dr. W. Herschel has recently discovered, the mixing of nitrate of silver with hypo-sulphate of soda, both remarkably bitter substances, produces the sweetest substance known. Thus, bitter and sweet, as well as sour, appear not to be an essential quality in the matter itself, but to depend on the proportions of the mixture which composes it.

CRYSTALLIZATION.

Why do the figures of crystals vary in regularity?

Because their regularity is influenced by the rapidity of the evaporation: thus, if the process be slowly conducted, the particles unite with great regularity;

if hurried, the crystals are irregular and confused. To obtain very regular crystals, the evaporation must be spontaneous, or that which takes place at common temperature.

Why is the Giant's causeway disposed in angular columns?

Because it is supposed that the whole body of the rock was once in a state of fluidity, being no other than the lava of a burning mountain; that the prodigious mass cracked in its cooling, into the above forms; that it may since in some measure have been deranged by earthquakes; that these have swallowed up the volcano itself; and that the waters of the neighbouring ocean now roll over the place where once it stood.—*Parkes.*

The most remarkable basalt is the columnar, which forms immense masses, composed of columns, thirty, forty, or more feet in height, and of enormous thickness. Those at Fairhead are 250 feet high. The coast of Antrim, in Ireland, for the space of three miles in length, exhibits a very magnificent variety of columnar cliffs; and the Giant's causeway consists of a point of that coast, formed of similar columns, and projecting into the sea for a descent of several hundred feet. These columns are for the most part hexagonal, (or six-sided) and fit very accurately together; but most frequently not adherent to each other, though water cannot penetrate between them. In the Hebrides are likewise some vast specimens of basalt.

Why are certain bodies porous, or full of small vacant spaces?

Because of the crossing of the constituent crystalline needles or plates in bodies.—*Arnott.*

Why are crystals mechanically divided only in certain directions, so as to afford smooth surfaces?

Because, in every crystallized substance, whatever may be the difference of the figure which may arise from modifying circumstances, there is, in all its crystals, a *primitive* form, the nucleus, as it were, of the crystal, invariable in each substance, giving rise to the actually outward existing forms.—*Parkes.*

Why has strong salt and water a pellicle (or film) on its surface?

Because the attraction of the saline particles for each other is becoming superior to their attraction for the water. This is the common criterion of the fitness of a solution for crystallization.

Sir Isaac Newton seems to have had a very clear idea of the cause of crystallization. "When," says he, "a liquor saturated with a salt, is evaporated to a pellicle, and sufficiently cooled, the salt forms in regular crystals. Before being collected, the saline particles floated in the liquor, equally distant from each other; they acted, therefore, mutually on each other, with a force which was equal at equal distances, and unequal at unequal distances; so, in virtue of this force, they must arrange themselves in an uniform manner."—*Newton's Optics, Book* iii.

Why will not salt crystallize when dissolved in a considerable quantity of water?

Because the particles of the salt are too far asunder to exert reciprocal attraction: in other words, they are more powerfully attracted by the water, than by each other.—*Brande.*

Why does the salt crystallize upon evaporation of part of the water?

Because some of the saline particles then gradually approach each other, and they will, according to certain laws, become regular solids; another portion of the salt will remain dissolved in the water which is left; this is usually called the *mother liquor*, or water.

There is a great variety in the form of crystallized salts, and each salt preserves its own peculiar form:

thus, common culinary salt generally crystallizes in small tubes, and sulphate of soda in six-sided prisms.

Why do certain salts (called freezing mixtures) convert water into ice?

Because, as heat is required to convert solids into liquids, it follows, that in cases of sudden liquefaction, (as when the salts are dissolved in the water) *cold* will ensue: hence its production during the solution of many saline bodies, and hence, also, the explication of the theory of *freezing* mixtures

The artificial preparation of ice has occupied much of the attention of modern chemists. The most recent experiments were made by M. B. Meijlink, who, after numerous trials, with different salts, for the purpose of converting water contained in a tin vessel into ice, during their solution, ultimately gave the preference to a mixture of four ounces of nitrate of ammonia, four ounces of sub-carbonate of soda, and four ounces of water. This mixture, in three hours, produced ten ounces of ice; whilst, with the mixture of sulphate of soda and muriatic acid, he obtained ice only after seven hours. —*Brande's Journal*, 1829.

Why do many salts, when exposed to the air, effloresce, or fall to powder?

Because they lose their water of crystallization.

Why do some salts effloresce more than others?

Because some thus completely lose their water; while others retain different quantities, according to the dryness of the air.

Why do some salts deliquesce, (or become moist or liquid) by exposure to the atmosphere?

Because they attract water from the atmosphere.

Why are not salt boilers made of cast iron?

Because the cast iron would crack by the adhesion of the salt.

Why is salt-petre refined by solution in water?

Because the rough petre, as it is called, is always contaminated with muriate of soda and other salts. In order, therefore, to separate them, the refiners dissolve the whole in water, and then, by boiling the solution, evaporate a part of the water, and the muriate of soda, &c. fall down, while the salt-petre is held in solution. When the greatest part of these salts is thus separated, the remaining liquor is suffered to cool, and the nitre is obtained in crystals. This process illustrates the difference which there is in the solubility of salts.—*Parkes.*

Why was nitre used in the composition of Greek-fire?

Because it fed or kept alive the sulphur, resin, alcohol, camphor, &c. of which the fire was also composed, by conveying oxygen from the atmospheric air to the sulphurous gas, and to the sulphur while burning. Into this composition, when melted, woollen cords were dipped, and rolled up for use. These balls being set on fire, were thrown into the tents of the enemy, and as the combustibles were furnished with a constant supply of oxygen from the nitre, nothing could extinguish them.

Why will a lump of alum in a glass of water, assume a pyramidal shape in dissolving?

Because, at first the water acts with so much energy as to overcome the cohesion of the solid in every direction; but, as the particles of the alum become united with those of the water, the power of the solvent diminishes. The particles of water which combine first with the alum, become heavier by the union, and fall to the bottom of the glass; and the action at the lower extremity ceases, before it is complete at the upper. When the action has nearly terminated, if we closely examine the lump, we shall find it covered with geometrical figures, cut out, as it were, in relief, upon the mass; showing, not only that cohesion resists the power of solution, but that, in the present instance, it resists it more in some directions that in others; and that when the attraction of the solvent is nearly satisfied, it is balanced by that delicate modification of cohesion, upon which crystalline arrangement depends. This experiment beautifully illustrates the opposite action of cohesion and repulsion.

Why is alum used in making candles?

Because it gives firmness to the tallow.

Nitre has very recently been applied to the improved preparation of candles, by steeping the cotton wick in lime water, in which is dissolved a considerable quantity of nitre. By this means is obtained a purer flame and a superior light; a more perfect combustion is ensured; snuffing is rendered nearly as superfluous as in wax-lights; and the candles thus made do not run, or waste. The wicks should be thoroughly dry before the tallow is put to them.—*Brewster's Journal*, 1829.

Why is alum used in salt-drying cod-fish.

Because it prevents the salt from dissolving.

Why is alum used for preparing paper for the preservation of gunpowder?

Because it prevents the bad effects of damp atmospheric air upon the powder, and preserves the paper from readily taking fire.

Why are the crystals collected in camphor bottles in druggists' windows always most copious upon the surface exposed to the light?

Because the presence of light considerably influences the process of crystallization. Again, if we place a solution of nitre in a room which has the light admitted only through a small hole in the window-shutter, crystals will form most abundantly upon the side of the basin exposed to the aperture through which the light enters, and often the whole mass of crystals will turn towards it.—*Brande.*

Why is there rock salt?

Because it is supposed to have been deposited by the sea, or by salt lakes drying up, which formerly covered the present continents. Salt strata also diminish in thickness as they recede from the sea. This is perhaps the most obvious hypothesis, but it is liable to many objections, one of which is the enormous depth of sea water necessary to the production of a body of rock salt above forty yards in thickness, such as the insulated mountain of rock salt at Cordova, in Spain."—*Notes on Science.*

The salt mines near Cracow, in Poland, which have been worked ever since the middle of the thirteenth century, contain an immense store of muriate of soda. Eight hundred workmen are employed in them, who raise 168,000 quintals of salt annually. Through the enormous mass of salt, which presents to the eye no interruption to its saline texture, and at the depth of 450 feet, flows a stream of pure, fresh, and transparent water, which is received in large troughs, where the workmen and horses of these subterraneous regions quench their thirst. As it was impossible that this spring could filter through the salt, Nature, who buries her masterpieces in the bowels of the deepest mountains, has placed in this mass a stratum of clay sufficiently thick to allow the stream of water, destined to refresh the workmen, to pass through it in such a manner as to be preserved from the salt, of which a small quantity would injure its salubrity.—*Parkes.*

A series of ingenious models of the Polish salt mines was exhibited in London about two years since.

Why are the flats cut near the sea, on the Kentish coast, called salt-pans?

Because at high tide they become filled with sea-water, which being confined there, the sun evaporates it, and leaves salt in the flats, from whence it is laid up to dry for use.

Why is sugar refined by boiling the syrup in a vacuum, or place from which the air has been excluded?

Because this, and all other liquids, are driven off, or made to boil at lower degrees of heat when the atmospheric pressure is lessened or removed. Thus, the process for refining sugar is to dissolve impure sugar in water, and after clarifying the solution, to boil off or evaporate the water again, that the dry crystallized mass may remain. Formerly this evaporation was performed under the atmospheric pressure, and a heat of 218° or 220° was required to make the syrup boil; by which degree of heat, however, a portion of the sugar was discoloured and spoiled, and the whole product was deteriorated.

The syrup, during the process *in vacuo*, is not more heated than it would be in a vessel merely exposed to a summer sun. The vacuum is produced and maintained by air-pumps driven by a steam engine, or otherwise; or by the direct admission of steam, which, after expelling the air, is condensed into water.—*Arnott.*

By this process more money has been made in a shorter time, and with less risk and trouble, than was ever perhaps gained from an invention!

Why are the vessels for evaporating or distilling in vacuo, generally of arched form?

Because they require to be strong enough to bear, when quite empty, the external atmospheric pressure. —*Arnott.*

Why is sugar-candy crystallized on strings, and verdigris on sticks?

Because crystallization is accelerated by introducing into the solution a nucleus, or solid body, (like the string or stick) upon which the process begins.

The ornamental alum baskets, whose manufacture was once so favourite a pursuit of lady-chemistry, were made upon this principle; the forms of the baskets being determined by wire framework, to which the crystals readily adhered.

Why is sugar-candy sometimes in large and regular crystals?

Because the concentrated syrup has been kept for several days and nights *undisturbed*, in a very high temperature; for, if perfect rest and a temperature of from 120° to 190° be not afforded, regular crystals of candy will not be obtained.

The manufacture of barley-sugar is a familiar example of crystallization. The syrup is evaporated over a slow heat, till it has acquired the proper consistence, when it is poured on metal to cool, and when nearly so, cut into lengths with shears, then twisted, and again left to harden.

Why are small, radiant, and tree-like crystallizations seen on dirty windows in London?

Because of the great number of coal fires in the metropolis: these crystals (of sulphate of ammonia, or at least, sulphite of ammonia, which becomes sulphate by exposure to the air) being an abundant product of the combustion of coal.—*Brande.*

Why do some springs petrify objects by their spray?

Because their water is impregnated by means of its carbonic acid, with a large portion of carbonate of lime, which it deposits on issuing into the air. At Clermont, in France, there is such a spring, where Mr. Scrope saw the stuffed skins of a horse and a cow, birds, fruit, flowers, &c. undergoing this petrifying process. Its incrustations have also formed an elevated natural aqueduct, 240 feet in length, and terminating in an arch thrown across the stream it originally flowed into, 16 feet high and 12 wide.—*Scrope's Memoir on the Geology of Central France.*

Why is fluor spar so called?

Because it has the property of increasing the fusibility of other mineral substances. It has also been called *vitreous* spar, because when fused it has the appearance of glass.

HEAT.

Why is heat considered one of the chief agents in chemistry?

Because its most obvious sources are chiefly referred to the general head of chemical combination. Thus, fire, or the combustion of inflammable bodies, is nothing more than a violent chemical action attending the combination of their ingredients with the oxygen of the air. Animal heat, is, in like manner, referable to a process bearing no remote analogy to slow combustion, by which a portion of *carbon*, an inflammable principle existing in the blood, is united with the oxygen of the air in respiration, and thus carried off from the system: fermentation is nothing more than a decomposition of chemical elements loosely united, and their reunion in a more perfect state of combination. Friction, as a source of heat, is well known: we rub our hands to warm them, and we grease the axles of carriage-wheels to prevent their setting fire to the wood. Again, Count Rumford has established the extraordinary fact, than an unlimited supply of heat may be derived by friction from the same materials.—*J. F. W. Herschel.*

Savages light their fires by rubbing two pieces of wood: Count Rumford made great quantities of water boil, by causing a blunt borer to rub against a mass of metal immersed in the water; and Sir Humphry Davy quickly melted pieces of ice by rubbing them against each other, in a room cooled below the freezing point. Instances have occurred, where whole forests have been burned down by fires kindled from the violent friction of the branches against each other by the wind.

Why is it conjectured that there is a difference between solar and terrestrial heat?

Because the rays of the first pass through glass without heating it, while the rays of the latter are stopped by the glass, which becomes hot when opposed to them.

Why may heat be considered as a power opposed to attraction?

Because it tends to separate the particles of bodies; and whenever a body is heated, it is also expanded.—*Brande.*

Why is the term caloric used?

Because it may distinguish the cause of heat from the sensation which we call by the same name; but the terms *caloric* and *calorific fluid* seem to imply the material nature of heat, which has not yet been proved.

Why is caloric considered a subtle material fluid, the particles of which mutually repel each other?

Because this supposition appears to give a plausible explanation of most of the phenomena dependent upon heat, as the expansion, fusion, and vapourization of bodies, on the idea that the particles of caloric when interposed between the particles of bodies, in sufficient quantity, produce these effects. It is natural to suppose when a body is enlarged in bulk, that the enlargement is occasioned by the introduction of the particles of other matter, by which the particles of the expanded body are repelled to a greater distance from one another; and this repulsion becomes so great, in consequence of the introduction of a large quantity of heat, as to enable the particles of solid bodies to assume the fluid, or aëriform states.

There are, however, other theories of the nature of heat; but the question remains undetermined; and it is fortunate that most of the phenomena connected with the operation of heat, may be explained equally well upon either theory.

Why is heat called latent?

Because, when heat liquefies a solid, or converts a liquid into vapour, the liquid or the vapour is no *hotter* than the solid or liquid from which it was produced, though a great deal of heat has been expended in producing this effect, and has actually entered into the substance. Hence it continues to exist in the product, maintaining it in its new state without increasing its temperature, and is thus *latent* or hidden. This great discovery was made by Dr. Black, who further proved, that when the vapour condenses, or the liquid freezes, this latent heat is again given out from it.

Why does water thrown upon a fire so powerfully repress it?

Because of the great quantity of heat latent in steam;—hence, again, why *fire* and *water* are so often adduced proverbially as furnishing a striking contrast. —*Arnott.*

Why does iron become red-hot by hammering?

Because of the condensation of the metal by the force of the blow. Air may also be condensed by pressure, so as to set tinder on fire.

Why are inorganic bodies, such as gold, iron, &c. found in all parts of the globe?

Because they have no direct dependence, in the present state of the earth, at least, on the solar heat, or its consequences; whereas organic, or living matter, has.

Why does ice, when heated, become water; and the water, when heated further, become steam?

Because the continued addition of heat gradually increases the mutual distance of the constituent atoms of the ice, and their cohesive attraction is overcome; till, at length, the atoms are repelled to still greater distances, and the substance is converted into steam! Abstraction of heat causes return of states in the reverse order; the steam when cooled again, becomes water as before, and the water, when cooled, becomes ice.

Why does a pint of water, when converted into steam, occupy nearly 2000 times the space of the water?

Because the heat merely produces a repulsion among the particles, and by no means fills up the interstices.—*Arnott.*

Why are air-expansion engines so much more powerful than steam-engines?

Because heat, when used to dilate air, produces about four times the quantity of expansive power that it does when used to form steam.

Why is not high-pressure steam issuing from a boiler heated perhaps to 300° not hotter than low-pressure steam from a boiler at 212°?

Because, in the instant when the high-pressure or condensed steam escapes into the air, it expands until balanced by the pressure of the atmosphere; that is, until it become low-pressure steam, and it is cooled by the expansion, as air is cooled on escaping from any condensation.

Why does not a generator, if cracked when very hot, immediately let out the vapour or water?

Because the heat repels the water and vapour to a certain distance from the metal, and, virtually, stops the crack, until the temperature is allowed to fall, when the rush of steam by the crack is tremendous. Mr. Perkins, in reasoning upon this effect, says: "The repulsive power of the heated metal is sufficient to retain the *vapour* and the water equally distant; for, what else is vapour than water in a state of expansion?"

Why does a Prince Rupert's Drop fly to powder on being simply broken?

Because it is a lump of glass let fall, while fused into water, and thereby suddenly cooled and solidified on the outside, before the internal part is changed; then as this at last hardens and would contract, it is kept extended by the arch of external crust to which it coheres. Now, if a portion of the neck of the lump be broken off, or if other violence be done, which jars its substance, the cohesion is destroyed, and the whole crumbles to dust with a kind of explosion.—*Arnott.*

Why does a loose bladder, tied at the mouth, and held before a fire, gradually swell and appear fully inflated?

Because the small quantity of air contained in the bladder is then so much dilated by the heat, that it occupies a considerably increased space, and fills the bladder, of which it before occupied only a small part.

Why does change of temperature retard or hasten the decomposition of dead vegetable and animal substances?

Because the functions of life bring into combination, to form the curious textures of organic or living bodies, chiefly four substances, viz. *carbon*, or coal; the ingredients of water, or *oxygen* and *hydrogen*; and lastly, *nitrogen*;—which substances, when in the proportions found in such bodies, have but slight attraction for each other, and all of which, except the *carbon*, usually exist as airs. Their connexion, therefore, is easily subverted, and particularly by a slight change of temperature, which either so weakens their mutual hold as to allow new arrangements to be formed, or altogether disengages the more volatile of them.—*Arnott.*

Why is iron preserved from rust by dipping it when at a dull red heat, into water, and then into linseed oil?

Because the first part of the process frees it from the scales and extraneous matter, and the remaining heat disposes it to receive the oil, which forms a varnish, and filling up all the minute interstices of the surface, prevents any rust.

Why do clocks and watches vary in their rate of going?

Because of the expansion and contraction of the metals of which they are constructed. Thus, in regulating the length of the second's pendulum, an exact acquaintance with the dilatation of metals, is essential; for when the bob is let down a hundredth part of an inch, the clock loses ten seconds in twenty-four hours; hence, a thousandth part of an inch will cause it to lose one second per day, and a change of temperature equal to 30° of Fahrenheit will alter its length about one five thousandth part, and occasion an error in the rate of going, of eight seconds per day. Variations of temperature also occasion variations in the balance-wheels of watches, which are obviated by various compensating apparatus.

Why does a compensation balance prevent the effects of expansion or contraction?

Because it consists of interrupted concentric rings of different metals, joined together, so that the expansion of one counteracts the expansion of the other.

Why do the iron hoops of brewers' casks bind with such great force?

Because those which are at first made too small to fit, are heated until they are sufficiently enlarged; they are then driven on, and suddenly cooled, by throwing water upon them; the contraction of the iron which ensues on cooling, bringing the parts of the vessels in closer contact than they could easily be brought by other means, and fixes the hoops firmly round them.

Why does hay, if stacked when damp, take fire?

Because the moisture elevates the temperature sufficiently to produce putrefaction, and the ensuing chemical action causes sufficient heat to continue the process; the quantity of matter being also great, the heat is proportional.

Why are concave mirrors employed as burning-glasses?

Because they collect the heat of the sun's rays from the whole of its surface to a single point, thus accumulating a very great degree of heat, for the combustion and fusion of various natural substances, that are fusible in the greatest heat capable of being produced from ordinary fire. By this means, Drs. Harris and Desaugliers melted a silver sixpence in seven seconds and a half; a copper halfpenny melted in sixteen seconds, and liquefied in thirty-four seconds; tin was melted in three seconds; and a diamond weighing four grains, lost seven-eighths of its weight. Buffon also, with the faint rays of the sun in the month of March, set on fire boards of beech-wood at a hundred and fifty feet distance; and at another time, silver was thus fused at fifty feet distance.

Why are not "inflammable" and "combustible" synonymous terms?

Because all metals are combustible; that is, capable of igniting with oxygen: but they will not burn in atmospheric air, and are therefore not called inflammable.

Why does the thermometer enable us to ascertain degrees of heat?

Because the fluid ascends in the tube on being expanded by heat, and thus marks the degree.

Why is mercury preferred in thermometers?

Because the range of temperature between its freezing and boiling points is very considerable; and its expansion within that range, tolerably equable.—*Brande.*

Why have thermometers freezing and boiling points?

Because they denote the points in the tube at which the mercurial column stands when cooled to the freezing, and heated to the boiling, of water. For this purpose, the instrument is immersed in melting ice or snow, and permitted to remain there for some time, until the quicksilver becomes stationary at one place, which is the *freezing point;* a mark is made at that point upon the glass. If the instrument remains for some time in boiling water, the mercury after having ascended through a large proportion of the tube, becomes stationary at one place which is the *boiling point.* It is believed that Fahrenheit took his *zero*, or commencement of his scale from the degree of cold produced by mixing snow and common salt; that being the greatest degree of cold known in his time; although a considerably greater degree of cold may be produced by mixing the same or other ingredients.

Why does Reaumur's thermometer differ from Fahrenheit's?

Because Reaumur divides the space between the boiling and freezing points into 80 degrees, placing zero at freezing, and the 80th degree at the boiling point.

Fahrenheit divides the same space into 180 degrees; but the cipher (0) he places 32 degrees below the freezing point (the cold of a mixture of snow and common salt) so that the freezing point is at 32° and the boiling point at 212°.

Reaumur 80°)180° Fahrenheit

2¼° of Fahrenheit—equal to 1° of Reaumur.

Plus 20° of Reaumur is 20° multiplied by 2¼=45 add 32°=77° of Fahrenheit.

Why are spirit thermometers preferable for measuring very low temperatures?

Because spirit never freezes, whereas the low temperature at which it boils, renders it unfit for measuring high temperatures.

Why do dogs and other animals put out their long moist tongues in hot weather?

Because, when much heated, they cannot throw off or diminish their natural covering, and have only the above means of increasing the evaporation from their bodies.

Why, in the Arctic Regions, are the watery parts of brandy frozen, while a very small quantity of strong *spirit is left in the fluid state in the interior of the mass?*

Because the cohesion of the particles of water is so much more increased by the cold than that of the particles of the spirit.

Why is a pyrometer so called?

Because of its origin from two Greek words signifying *measure of fire;* it being used to ascertain the degrees of heat in high temperatures, and including a range of nearly 32,000 degrees of Fahrenheit.

Why does metal feel cold when touched?

Because it readily carries off the heat of the body; all metals being good conductors of heat.

Why are certain bodies called good and bad conductors of heat?

Because, when exposed to the same source of heat, they suffer it to pass through them with different degrees of velocity; or they have various conducting powers with regard to heat. Good conductors, when touched, occasion a greater sensation of heat and cold than bad ones. When the body feels cold, the caloric is passing out of it into the neighbouring object: when the body feels warm, it is receiving heat.

Why are persons enabled to remain in a heated oven, wherein meat is baking?

Because of the rarity of the air, its weak conducting power, and its small capacity for caloric, which explain how a person can exist in so warm an atmosphere. The wool dresses which persons usually wear on such occasions, are also bad conductors of heat.

Sir C. Blagden, secretary to the Royal Society about thirty years since, remained, accompanied by a female dog, during eight minutes, in an oven heated to 100° of Reaumur, 20° above the point at which water boils; water, although covered with oil, boiled close to him; and in thirteen minutes, the hot air being concentrated by a pair of bellows, some beef was dressed in the same place. Two French academicians, of the last century, saw at Larochefoucault a man, who, from habit, supported during ten minutes the heat of an oven, in which fruits and meats were cooked; they found the heat to be 112° of Reaumur, 32° above that of boiling water. The rarity of the air, its weak conducting power, and its small capacity for caloric, serve to explain how a person can exist in so warm an atmosphere. It is by its action upon the skin, and the consequences which ensue from that, that fire becomes injurious. Now the "Fire King," who exhibited himself in London last spring, was wrapped up in wide pantaloons, of red wool, a loose mantle also of wool, and wore on his head a great quilted felt cap; and the wool being a bad conductor of heat, this wonder-working genius should awaken the astonishment of the ignorant alone.

Why are porous or spongy substances, as feathers, fleecy matter, &c. bad conductors of heat?

Because, in great measure, of the quantity of air which they have in their structure; air being, probably, the worst conductor known, that is, the substance which, when at rest, impedes the passage of heat the most.—*Arnott.*

Why does a drop of water roll about on a red-hot iron without evaporation?

Because its surface becomes so highly polished as to reflect all the heat. If the heat be less, the water penetrates the pores of the oxidated iron, and losing its polish is evaporated.

Why is water frozen in a vessel from which the air has been pumped out, and which contains bodies that quickly absorb its vapours?

Because the evaporation of the water is thus accelerated—the heat required for the conversion of one portion of the water into vapour, being taken from the other portion, which is thus reduced to ice.

Why is soft and flabby meat unfit for cooking?

Because, after the rigidity has totally ceased, animal flesh soon experiences the commencement of those chemical changes which terminate in putrefaction.

Why do confectioners melt ice with common salt?

Because they thus produce cold much greater than that of the original ice.

Why do not springs freeze?

Because the earth conducts cold or heat but slowly, and the most intense frosts penetrate but a few inches into it; the temperature of the ground, a few feet below its surface, is nearly the same all the world over.—*Arnott.*

Why are many of the gothic halls and cathedrals cool in summer and warm in winter?

Because, in proportion as buildings are massive, they acquire more of those qualities, which have just been noticed, of our mother-earth.—*Arnott.*

Why is the degree of cold greater the farther we remove from the earth's surface?

Because the air is not heated immediately by the rays of the sun passing through it; but on their meeting with an opaque (or dense) body, as the earth, their heat is elicited, and thence gradually communicated to the surrounding atmosphere.

In winter, the earth, at eighteen inches depth, is warmer than the air; in summer, the air is warmer than the earth at that depth: these effects are owing to the earth being a bad conductor of heat.—*Parkes.*

Why do the Swiss peasants, when they wish to sow their seed, spread black cloth on the surface of the snow?

Because it may absorb the sun's rays, and facilitate the melting of the snow. Dr. Franklin, to exemplify the effect of the different colours in absorbing heat, covered snow with pieces of cloth of different colours, at a time when the sun was shining fully upon the snow. Having done so, he observed that the snow under the black cloth was melted first, then that under the blue, then under the brown, whilst that under the white cloth was very inconsiderably melted.

Why are the heights of mountains calculated by the temperature at which water boils upon their summits?

Because, if we diminish atmospheric pressure, we lower the boiling point. Thus, water, under mean atmospheric pressure of 30 inches of mercury, boils in a metallic vessel at 212°. At the top of Mont Blanc, Saussure found that it boiled at 187°, from the atmosphere being less dense there than below.

Why is the air warm in misty or rainy weather?

Because of the liberation of the latent heat from the precipitated vapour.

Why is heated air thinner or lighter than cold air?

Because it is a property of heat to expand all bodies; or rather we should say, that we call air hot or cold, according as it naturally is more or less expanded.

Why is a tremulous motion observable over chimney-pots, and slated roofs which have been heated by the sun?

Because the warm air rises, and its refracting power being less than that of the colder air, the currents are rendered visible by the distortion of objects viewed through them.

Within doors, a similar example occurs above the foot-lights of the stage of a theatre; the flame of a candle, or the smoke of a lamp.

Why are the gas chandeliers in our theatres placed under a large funnel?

Because the funnel, by passing through the roof into the outer air, operates as a very powerful ventilator, the heat and smoke passing off with a large proportion of the air of the house.

The ventilation of rooms and buildings can only be perfectly effected, by suffering the heated and foul air to pass off through apertures in the ceiling, while fresh air, of any desired temperature, is admitted from below. —*Brande.*

Why is the atmosphere of theatres, and other crowded places, prejudicial to health?

Because it has been found, that in a theatre, from the commencement to the end of the play, oxygen or vital air is diminished in the proportion of from 21 to 27, or nearly one-fourth, and is in the same proportion less fit for respiration than before.—*Lavoisier.*

Why are diving-bells restricted in their descent to ten or twelve fathoms?

Because of the density, and more especially the heat, of the air, although renewed by forcing pumps, becoming insupportable.

Why does the bark of trees resemble clothing?

Because it allows the heat to pass from the tree but slowly, and secures, therefore, the temperature necessary to vegetable life.

That caloric is as necessary for the support of vegetable as it is for that of animal life, may be proved by direct experiment. If, in the middle of winter, a hole be bored in a tree, and a thermometer put into it, it will be seen that the tree is many degrees warmer than the atmosphere.

Why does the effect of wind, or motion of the air, quicken evaporation?

Because it removes air saturated with the moisture, and substitutes air which is not, thus producing nearly the case of the substance placed in a vacuum.

Why do liquids evaporate neither so rapidly nor so greatly in air, as in a vacuum?

Because the presence of the air impedes the spreading from the liquid surface of the newly-formed vapour, and keeps it where its pressure resists the formation of more vapour; and, because the air in contact with a liquid, shares its higher temperature with the liquid. Still, in India, flat dishes of water, placed through the night on beds of twigs and straw, kept wet, and in a current of air, soon exhibit thin cakes of ice—and thus ice is procured in India, for purposes of luxury.—*Arnott.*

Why do heated sea-sand and soda form glass?

Because, by heating the mixture, the cohesion of the particles of each substance to those of its own kind is so diminished, that the mutual attractions of the two substances come into play, melt together, and unite chemically into the beautiful compound called glass.

Why is sand used in glass?

Because it serves for stone; it being said, that all white transparent stones which will not burn to lime are fit to make glass.

Why do cracked glass vessels allow liquors to escape more or less?

Because of the various fissures, which are distinguished into four kinds. The first are such, that the liquid contained in the broken vessel escapes through them into the air. The second are such as retain the liquid, unless the vessel be immersed in water, or a similar fluid, and then the levels of the two portions of the fluid, tend to approach each other. The third are not permeable, (or, to be passed through) unless the fluids on opposite sides have a chemical action on each other: this is also the effect produced by the membrane of the bladder. The fourth kind are so fine, that no fluid passes, except in a single case.—*Fischer.*

Why is fine table-glass very liable to wear and damage?

Because of the great quantity of oxide of lead which it contains, to give it more density and refractive power. Its disadvantages are extreme softness, great fusibility, and liability to be corroded by acids. A considerable quantity of this oxide is contained in that glass used for lustres, for artificial gems, and for most optical purposes. The superior appearance of Guinand's Swiss flint-glass is attributed to the quantity of oxide of lead which it contains.

ELECTRICITY.

Why is electricity so called?

Because of its origin from *electron*, the Greek name of amber,—the phenomena displayed by rubbing a piece of amber, being the first physical fact recorded in the history of science.

Electricity investigates the attractions and repulsions, the emission of light and explosions, which are produced not only by the friction of vitreous, resinous, and metallic surfaces, but by the heating, cooling, evaporation, and mutual contact of a vast number of bodies.

Why are certain bodies called conductors of electricity?

Because they suffer electricity to pass through their substance. The metals are all conductors; according to Mr. Harris, (*Phil. Trans.* 1827) silver and copper are the best conductors; then gold, zinc, and platinum, iron, tin, and lead. Well burned charcoal and plumbago also conduct.

Why are other bodies called non-conductors?

Because they only receive electricity upon the spot touched. Dry air, glass, sulphur, resins, and oils, are non-conductors. Water, damp wood, spirit of wine, damp air, some oils, and most animals and plants, are imperfect conductors.

Why have different bodies various conducting powers for electricity?

Because their degree depends on the quantity of electricity which traverses them; so that of two conducting bodies, that which is the best for one electric current, may be the worst for either a stronger or a weaker current.—*Professor Delarive, of Geneva.*

Why are the phenomena of electricity called negative and positive?

Because, Franklin, observing that the same electricity was not inherent in the same body, but that glass sometimes exhibited the same phenomena as wax, and wax as glass, instead of regarding the phenomena as dependent upon two electric fluids, referred them to the presence of one fluid, in excess in some cases, and deficient in others. To represent these states, he used the terms *plus* and *minus*, *positive* and *negative*. Thus, when glass is rubbed with silk, a portion of electricity leaves the silk and enters the glass; it becomes positive, therefore, and the silk negative: but when sealing-wax is rubbed with flannel, the wax loses and the flannel gains; the former, therefore, is negative, and the latter positive. All bodies in nature are thus regarded as containing the electric fluid; and when its equilibrium is disturbed, they exhibit the phenomena just described.—*Brande.*

Why does an electrical machine produce flashes and sparks of light, when the plate or cylinder is turned?

Because, it is conjectured, of the sudden compression of the air, or medium, through which the electricity passes: it is, probably, always attended by a proportionate elevation of temperature, as is shown by the power of the spark to influence spirits of wine, fulminating silver, and other easily inflammable compounds. —*Brande.*

Why will a feather adhere to rubbed or excited sealing-wax, and then fall off?

Because it is attracted by, and remains in contact with, the wax, till it has acquired its electricity, when it will be repelled, and in that state of repulsion, it will be attracted by an excited glass tube.

Why does the appearance of electric fire vary?

Because of the different density of the medium through which it passes. Thus, in common air, short sparks are straight, or nearly so, and long ones zig-zag; the former are brilliant, especially at their extremities, the latter usually of a paler or redder hue. In condensed air, the electric spark is bright and white; in rarified air it is of a reddish tinge, and faint and divided; in the more perfect vacuum of a good air-pump, it is of a purplish hue, and only visible in a dark room. In the most perfect vacua which can be obtained, it is scarcely visible, and of a greenish tint. In different gases the electric spark appears most brilliant in those which are most dense; in hydrogen gas it is faint and red; in carbonic acid it is vivid and white.—*Brande.*

Why is the electrical shock produced at the joints of the fingers, the elbows, shoulders, and chest, by holding the discharger of a Leyden phial?

Because there is an accumulation of electricity within the phial, which consists of a thin glass jar, coated internally and externally with tin-foil, to within a short distance of its mouth. When the inner surface is rendered positive by union with the conductor of the electrical machine, the exterior, being connected with the ground, becomes negative by vicinity or position. When the inner and outer surfaces are united by a conductor, all electrical accumulation is annihilated by a powerful spark, and the two opposite states are found to have been precisely equivalent. Metallic wires, with balls at their ends, bent or jointed, and fixed to a glass handle, are generally used to transfer the electric charge, and these instruments are called *dischargers.* A pane of glass, coated upon both sides to within an inch of its edges, with tin-foil, exhibits precisely the same phenomena as the phial; but it is a less convenient form of the apparatus.—*Brande.*

Why does the aura (or wind of an electrical machine) blow out a candle?

Because of the rapid succession of the electrified air. This effect is felt upon holding the hand near the point of a wire affixed to the conductor, when a peculiar coldness is perceived. It communicates motion to light bodies, as is seen in electrical fly-wheels, and in models of mills, orreries, and other amusing electro-mechanical apparatus.

Why is an arrangement of several Leyden jars called an electrical battery?

Because by a communication existing between all their interior coatings, their exterior being also united, they may be charged and discharged as one jar.

The discharge of the battery is attended by a considerable report, and if it be passed through small animals, it instantly kills them; if through fine metallic wires, they are ignited, melted, and burned; and gunpowder, cotton sprinkled with powdered resin, and a variety of other combustibles, may be inflamed by the same means.

Why is light produced in the empty part of a barometer tube, when it is shaken in a dark room?

Because the glass becomes electrified by the friction of the mercury. Even the friction of air upon glass is attended by electrical excitation: for it has been found, that by blowing upon a dry plate of glass, with a pair of bellows, it acquired positive electricity.

Why is a plate of zinc, when brought into contact with one of copper, or silver, found, after removal, to be positively electrical, and the silver or copper left in the opposite state?

Because of the electrical excitation by contact of the different metals, the most oxidizable (liable to rust) metal being always positive in relation to the least oxidizable metal, which is negative; and the more opposite the metals in these respects, the greater the electrical excitation; and if the metals be placed in the following order, each will become positive by the contact of that which precedes it, and negative by the contact of that which follows it, and the greatest effect will result from the contact of the most distant metals.

Platinum
Gold,
Silver,
Mercury,
Copper,
Iron,
Tin,
Lead,
Zinc.

Why are brass cocks in leaden cisterns corroded at the junction?

Because of the chemical effects of the contact of the metals. In like manner, the places where solder is applied are liable to depositions from the water. Iron railings are apt to be decayed and dissolved, where lead is used to fix them in stone cavities; and where iron is employed in fixing a bronze statue, my friend Mr. Chantrey (observes Mr. Brande) informs me that it prevents the acquisition of the desirable green rust.

Why have copper been substituted for iron nails and pins in fastening sheets of copper to ships' bottoms?

Because the galvanic action produced by the union of the two metals, iron and copper, was a great cause of destruction; and copper nails and pins, although not so strong, are not attended with the same inconvenience.

The last experiments which engaged Sir Humphry Davy's attention to any extent, were on this application of electrical combinations, for the purpose of preserving the copper sheathing of ships' bottoms. To this subject Sir Humphry Davy gave much of his time, and personally inspected all the boats and vessels on which the trials were made. Although the theory upon which they were conducted proved eminently correct, no advantage could be ultimately taken of the plans which it suggested. The saving of the copper was wholly counterbalanced by an accumulation of shell-fish and sea-weed on the sheathing, which became sufficient, in a short time, to prevent the proper command of the ship at the helm.

Why is electricity supposed to consist in a rare, subtle, and highly elastic fluid?

Because a fluid of this kind, when accumulated in excess in bodies, tends constantly to escape, and seeks a restoration of equilibrium by communicating itself to any others where there may be a deficiency; thus, in its tendency to expand and diffuse itself, pervading with more or less facility the substance of conductors, but obstructed and detained from expansion more or less completely by non-conductors. It also appears that all electrical phenomena are explicable on this supposition.

Why is animal electricity also called galvanism?

Because of its discovery by Galvani, by the accidental suspension of recently killed frogs, by copper hooks, to the iron palisades of his garden, when he observed convulsive movements in the limbs of the animals, which no known principle could explain. Galvani, at length, ascribed these muscular movements to a series of discharges of a peculiar electricity, inherent and innate in living beings.

Why were the phenomena just mentioned, called Voltaic electricity?

Because Volta proved that they proceeded from the contact of the two dissimilar metals (of the hooks and palisades) copper and iron, producing such a disturbance of the electrical equilibrium as was sufficient to affect the most delicate of all electroscopes, (measures of electricity) the irritability of a newly-killed frog, though it was insensible to every electroscope of human construction. Galvani, however, proved that muscular convulsions could be produced in the limbs of dead frogs, altogether independent of metals.

Galvanism has of late years given birth to improvements that have changed the face of chemical philosophy. One of its most brilliant results is thus beautifully illustrated in a Treatise "on the objects, advantages, and pleasures of science," attributed to the present Lord Chancellor:—"It is to the results of the remark accidentally made upon the twitching in the frog's legs, not, however, hastily dismissed and forgotten, but treasured up and pursued through many an elaborate experiment and calculation, that we owe our acquaintance with the extraordinary metal, liquid-like mercury, lighter than water, and more inflammable than phosphorus, which forms, when it burns, by mere exposure to the air, one of the salts best known in commerce, and the principal ingredient in saltpetre."

Why was the Voltaic pile first constructed?

Because a slender rod of silver and of zinc, touching each other at one of their ends, and at the other brought into contact with the nerve and muscle, or spine and toes of a dead frog, having excited powerful convulsions, it occurred to Volta that a repetition, on a more extended surface, of that simple series of two metals and moisture, might produce a combined effect, capable of being felt by the human hand. Hence, he constructed, by regular alternations of silver, zinc, and moistened cloth or pasteboard, in a columnar form, the electro-chemical pile and battery. The best form of the Voltaic instrument is, however, that of a trough of earthenware, with divisions of the same material, (to be filled with dilute acid); and the metallic plates are attached to a bar of wood, so that they can be immersed and removed at one operation. Such is the great apparatus of the Royal Institution, the most powerful battery yet constructed in *electro-chemical intensity*. The whole surface is 128,000 square inches.

Mr. Pepys likewise constructed a battery of 2000 plates for the London Institution; and Mr. Children constructed a vast apparatus, the plates of which were two feet eight inches wide, and six feet high. They were fastened to a beam suspended by counterpoises from the ceiling of his laboratory, so as to be easily immersed into, or withdrawn from, the cells of the acid.—*Brande.*

There are six great eras in *electro-chemical science:* —1. Its first discovery by Galvani. 2. Volta's discovery of the contact of dissimilar metals disturbing the electric equilibrium. 3. Volta's invention of the pile. 4. The *chemical* power of this instrument first observed by Messrs. Carlisle and Nicholson, in the decomposition of water. 5. The identity of these chemical effects with those producible by common electricity, first discovered and demonstrated by Dr. Wollaston. And, lastly, the general laws of electro-chemical decomposition and transfer, revealed by Sir Humphrey Davy in a series of memoirs equally remarkable for genius and industry.—*Ure.*

Why is electricity continually active in nature?

Because general changes in the form and constitution of matter, are connected with its electrical states.

Why does it lighten?

Because of the accumulation of electricity in the clouds: hence it is, in philosophical parlance, called the *electric fluid.*

The discharge of electricity in a thunder-storm, is sometimes only from cloud to cloud; sometimes from the earth to the clouds; and sometimes from the clouds to the earth, as one or other may be positive or negative. When aqueous vapour is condensed, the clouds formed are usually more or less electrical; and the earth below them being brought into an opposite state, a discharge takes place when the clouds approach within a certain distance, constituting *lightning.*—*Brande.*

Why does it thunder?

Because of the undulation of the air, produced by the electric discharge just mentioned; thunder being more or less intense, and of longer or shorter duration, according to the quantity of air acted upon, and the distance of the place where the report is heard from the point of the discharge.

Mr. Brande, from whom we quote this explanation, gives a further illustration of this idea:—"Electrical effects take place in no sensible time: it has been found that a discharge through a circuit of four miles is instantaneous; but sound moves at the rate of about twelve miles in a minute. Now, supposing the lightning to pass through a space of some miles, the explosion will be first heard from the point of the air agitated, nearest to the spectator; it will gradually come from the more distant parts of the electricity, and, last of all, will be heard from the remote extremity: and the different degrees of the agitation of the air, and likewise the difference of the distance, will account for the different intensities of the sound, and its apparent reverberations and changes."

Sir H. Davy, in his *Elements*, says: "In a violent thunder-storm, when the sound instantly succeeds the flash, the persons who witness the circumstance are in some danger; when the interval is a quarter of a minute, they are secure."

Why are pointed conductors fixed as safeguards to buildings?

Because the fluid or lightning may be attracted and circulated along them, and thus kept from injuring the building, till at length it reaches the earth as a common reservoir.

In these cases, the conducting rod or rods should be of copper or iron, and from half to three-fourths of an inch in diameter. Its upper end should be elevated three or four feet above the highest part of the building, and all the metallic parts of the roof should be connected with the rod, which should be perfectly continuous throughout, and passing down the side of the building, penetrate several feet below its foundation, so as always to be immersed in a moist stratum of soil, or, if possible, into water. The leaden water-pipes attached to houses often might be made to answer the purpose of conductors, especially when thick enough to resist fusion.—*Brande.*

The magnificent effects of electricity in the thunder-storm, were first experimentally demonstrated by Dr. Franklin, whose whole life was passed in ameliorating the condition of his fellow creatures.

Why is the fireside an unsafe place in a thunder-storm?

Because the carbonaceous matter, or soot, with which the chimney is lined, acts as a conductor for the lightning.

Why is the middle of an apartment the safest place during a thunder-storm?

Because, should a flash of lightning strike a building, or enter at any of the windows, it will take its direction along the walls, without injuring the centre of the room.

Why is bed a place of comparative safety in a thunder-storm?

Because blankets and feathers are non-conductors. A woollen rug is likewise a non-conductor, but it should be removed from the chimney. Bell wires being conductors, are almost always melted in houses struck by lightning.

Why is it dangerous to take shelter under a tree during a storm?

Because the tree is a good conductor, probably from vegetation tending to atmospheric electricity, and the immediate vicinity of the tree being more highly electrical, as will be presently shown, (*See page* 47.)

The safest situation without doors, during a storm, is within some yards of trees, and upon the dryest spot that can be selected.

Why are ships at sea so often destroyed by lightning?

Because of the great quantity of metal, and particularly of iron, which is employed in the rigging; more especially as the metallic masses are there nearly insulated, or connected only by very imperfect conductors.

These inferences are drawn from an interesting account of an accident to the packet ship the New York, by lightning, in 1827. The paper is by Dr. Trail, and was communicated to the Royal Society by one of its most distinguished fellows, the present Lord Chancellor. It will, of course, be found in the *Philosophical Transactions* of the year, but, perhaps, more readily, in the *Arcana of Science and Art* for 1829.

Why is copper a better material for a conductor than iron?

Because copper is less liable either to fusion or conversion. A rod is also, from its continuity, a better form of conductor than a chain.

Why are there "returning" strokes of lightning?

Because they are due to the restoration of the natural electric state, after it has been disturbed by induction. Thus, if a person be brought into a highly electric and negative state by induction, from the approximation of a body highly charged positively, and then the latter be discharged by means having no connexion with the negatively electrified person, the negative state of the latter will be immediately destroyed, and an effect, in part analogous to a positive discharge of electricity, will be produced. Some of the most serious accidents which occur from lightning are supposed to be produced in this way; not by the mere disturbance of electricity in a person only, but of the electricity of those bodies with which the person may be in contact, and to which he accidentally serves as a conductor.

For an illustrative narrative of a returning stroke of lightning, near Paris, in September, 1826, see a paper translated from the *Annales de Chimie*, in the *Quarterly Journal of Science* for 1826.

Why are vitreous tubes occurring in elevated sandy districts, called "lightning tubes?"

Because they have been considered as produced by lightning, which melts the sand to a considerable depth, so as to form a tube, commonly sinuous, with solid and smooth walls internally, and rough on the outside. In 1828, a young German naturalist presented to his academy some of these tubes seventeen feet in length. It has been asked how electricity could produce effects so intense, and which have been considered so different from those obtained from artificial electricity; but this point has been decided by two eminent French chemists' success in forming fragments of tubes perfectly resembling the natural lightning tubes, only that their walls were less solid, and their length less.

Why have the gymnotus, or electric eel, and the torpedo, or electric eel, a benumbing effect when touched?

Because of certain singularly constructed organs given to those remarkable animals for the purposes of defence, which certain forms of the Voltaic apparatus much resemble; for they consist of many alternations of different substances. These electrical organs are much more abundantly supplied with nerves than any other part of the animal, and the too frequent use of them is succeeded by debility and death.—*Philosophical Transactions*, 1817.

Towards the close of his valuable life, Sir H. Davy dated from Lubiana, Illyria, (1828) an important paper containing a summary of his experiments on the torpedo. It will be found in the *Philosophical Transactions* of the year. Among the inferences drawn by Sir Humphry, is "a stronger analogy between *common* and *animal* electricity, than between Voltaic and animal electricity; and a probability that animal electricity will be found of a distinctive and peculiar kind." This opinion, it will be perceived, is at variance with the explanation quoted in the preceding paragraph.

Again, Sir Humphry observes, "the organ of the torpedo depends for its powers upon the will of the animal. John Hunter has shown how copiously it is furnished with nerves. In examining the columnar structure of the organ of the torpedo, I have never been able to discover arrangements of different conductors similar to those in galvanic combinations; and it seems not improbable that the shock depends upon some property developed by the action of the nerves."

Why do vegetables tend to atmospheric electricity?

Because of the action of the charcoal they contain upon the oxygen of the air; and when it is considered that on one hand about fifteen grains of charcoal, in becoming carbonic acid, gives out sufficient electricity to charge a Leyden jar; and, on the other hand, that the charcoal which is contained in vegetables does not give out less electricity than charcoal which burns freely, one may conclude, as direct experiments tend to prove, that over a surface of vegetation, 100 metres square, more electricity is produced in a day than is necessary to charge the strongest electrical battery.—*M. Pouillet, in the Annales de Chimie.*

Why is electricity beneficial to plants?

Because electrified seeds pass more rapidly through the first periods of vegetation, than such as are not electrified; and electrified roses flower more rapidly and abundantly. Plants with pointed leaves and spines attract electricity.

Why is the cutting down of forests found to diminish the quantity of rain?

Because it is supposed to diminish the attraction for clouds.

Why do leeches die suddenly at the approach of or during storms?

Because of the coagulation of their blood, caused by the impression of the atmospheric electricity.

Why is electricity considered an important chemical agent?

Because it not only produces an infinite variety of changes, but likewise influences almost all which take place. Thus, there are not two substances on the surface of the globe that are not in different electrical relations to each other; and chemical attraction itself seems to be a peculiar form of the exhibition of electrical attraction; and wherever the atmosphere, or water, or any part of the surface of the earth gains accumulated electricity of a different kind from the contiguous surfaces, the tendency of this electricity is to produce new arrangements of the parts of these surfaces; thus, a positively electrified cloud, acting even at a great distance on a moistened stone, tends to attract its oxygenous or acidiform, or acid ingredients, and a negatively electrified cloud has the same effect upon its earthy alkaline, or metallic matter; and the silent and slow operation of electricity is much more important in the economy of nature, than its grand and impressive operation in lightning and thunder. The chemical agencies of water and air are assisted by those of electricity; and their joint effects, combined with those of gravitation, and certain mechanical ones, are sufficient to account for the results of time.—*Sir H. Davy's Consolations in Travel.*

Why are magnetism and electricity, which had long been studied as separate branches of science, now effectually blended?

Because all the phenomena of magnetic polarity, attraction, and repulsion, have at length been resolved into one general fact, that two currents of electricity moving in the same direction repel, and in contrary directions attract, each other.—*Herschel.*

Hence, the magnetic effects of electricity constitute a new branch of science, under the title of *electro-*

magnetism. The more popular phenomena of magnetism, which it will be our object to explain, do not, however, belong strictly to chemical inquiry; we may therefore reserve their illustration for a more fitting occasion.

LIGHT AND FLAME.

Why may light and air be said to constitute a portion of our earth?

Because of their absorption by the earth. Thus, the light emitted by burning coals, (which are generally admitted to be of vegetable origin) has undoubtedly been condensed in them by a process of nature which bids defiance to conjecture.—*Mr. Detrosier of Manchester.*

Why does a fire give out warmth?

Because the heat is *radiated;* there being but little connexion with the immediate conducting power of the air; thus, if a concave *metallic* mirror be held opposite the fire, a heating and luminous focus will be obtained.

Why is ice produced in India (as described in page 34)?

Because, chiefly, of the high radiating powers of the dry straw which is strewed in the inclosures, containing the water in shallow dishes. Calm and serene nights are most favourable to this operation, and it is necessary that the straw should be dry; for, when wetted, the production of cold is prevented; a circumstance which shows that evaporation is not the cause of the diminished temperature. We quote this from Brande, although the conclusions do not coincide with the opinion quoted from Arnott, at page 33.

Why are certain rays of the sun termed decomposing?

Because they have a tendency to interfere with the chemical constitution of bodies. Besides this kind of rays, it is ascertained there are two others; the calorific, or heating rays; and the luminous, or colourific rays, which produce vision and colour.

Sir H. Davy has, in some general facts of great interest, traced an analogy between the effects of the sun's rays and the agencies of electricity.

Why are the terms red-hot and white-hot used?

Because, when bodies are rendered luminous by great elevation of temperature, the light which they emit often appears dependent upon the heat to which they are subjected. There are, however, certain bodies which, at high temperatures, are remarkable for the quantity and extreme brilliancy of their light, independent of actual combustion; this is the case with several of the earths, but more especially with lime, a small ball of which, about a quarter of an inch in diameter, being ignited in the flame of alcohol urged by oxygen gas, emits light; having about thirty-seven times the intensity of an Argand lamp burner.—*Brande.*

Lieutenant Drummond has proposed to apply this principle to the improvement of the illumination of light-houses; by substituting "for the Argand burners a small ball of lime ignited by the combustion of oxygen and hydrogen." His experiments are described in the *Philosophical Transactions*, 1830, as follows:—

"From this small ball, only three-eighths of an inch in diameter, so brilliant a light is emitted, that it equals in quantity about thirteen Argand lamps, or 120 wax candles; while, in intensity or intrinsic brightness, it cannot be less than 260 times that of an Argand lamp. These remarkable results are deduced from a series of experiments made lately at the Trinity House; and, having been repeated with every precaution, and by different individuals, there seems no reason to doubt their accuracy. In the best of our revolving lights, such as that of Beachy Head, there are no less than thirty reflectors, ten on each side. If, then, a single reflector, illuminated by a lime ball, be substituted for each of these ten, the effect of the three would be twenty-six times greater than that of the thirty. On account of the smaller divergence of the former it would be necessary to double their number, placing them in a hexagon instead of a triangle. In this case the expense is estimated at nearly the same. This method was tried lately at Purfleet in a temporary lighthouse, erected for the purpose of experiments by the corporation of the Trinity House, and its superiority over all the other lights with which it was contrasted, was fully ascertained and acknowledged."

Why are light and heat necessary to the existence of plants?

Because, in the sunshine, vegetables decompose the carbonic acid gas of the atmosphere, the carbon of which is absorbed and becomes part of their organized matter; and the oxygen, which is the other constituent, is thrown off.

Why do not plants flourish in the dark?

Because no oxygen is then produced by them, and no carbonic acid absorbed.

Light exercises a very remarkable influence upon the irritability of the sensitive plant. Thus, if a sensitive plant be placed in complete darkness, by carrying it within an opaque vessel, it will entirely lose its irritability, and that in a variable time, according to a certain state of depression or elevation of the surrounding temperature.

Again, Mr. Burnet finds that when a sensitive plant has been made to droop, if the part in which the moving power resides is blackened so as to absorb the light of the sun, the restoration of the plant to its natural state is very much longer before it takes place. He also finds that at the moment the expansion at the foot of the leaflets, or other parts, is touched, to produce the motion of the plant, it changes colour.—*Philos. Mag.*

Why are certain bodies said to be phosphorescent?

Because, when heated to a certain point below incandescence, (an exceedingly high temperature without the production of any gas) they become luminous, without undergoing combustion. Oil, wax, spermaceti, and butter, when nearly boiling, are luminous.—*Brande.*

Why are other classes of phosphorescent bodies called solar phosphori?

Because they become luminous when removed into a dark room after having been exposed to the sunshine. Of this description are Canton's, Baldwin's, and the Bolognian phosphorus, the latter named from its discovery by a shoemaker of Bologna.—*Brande.*

Wöhler, a German chemist, recommends, as likely to give phosphorus at a very cheap rate, to distil, by a strong heat, ivory black with half its weight of fine sand and charcoal powder. A silicate of lime is formed, and the carbonic oxide and phosphorus come over.

Dr. Bache, of Philadelphia, states, that at the temperature of sixty degrees Fahrenheit, or upwards, carbon in the form of animal charcoal, or lamp-black, causes the inflammation of a stick of phosphorus powdered with it; the effect takes place either in the open air, or in a close receiver of a moderate size.

Bodies *spontaneously phosphorescent* belong to another class. Among these are the flesh of salt-water fish just before it putrifies, and decayed wood. The glow-worm and the lantern-fly, certain shell-fish, medusæ, &c. are also luminous when alive; and the hundred-legged worm, and some other worms and insects, shine brilliantly when illuminated. These phenomena, as well as the phosphorescence of the sea, will, however, be explained elsewhere.

The phosphorescence of fish has already been noticed, and attributed to animalculæ *during putrefaction;* whereas, from the experiments of Canton, and of Dr. Hulme, it appears that "sea-fish become luminous in about twelve hours after death, that it increases till putrefaction is evident, and that it then decreases."

Why may flame in general be regarded as luminous gaseous matter?

Because hydrogen gas, probably, furnishes the purest flame which can be exhibited; for the flames of bodies which emit much light, derive that power from solid matter which is intensely ignited and diffused through them, and which in ordinary flames, as of gas, tallow, wax, oil, &c. consists of finely-divided charcoal.—*Brande.*

Dr. Ure, speaking of "the nature of flame, and of the relation between the light and heat which compose it," says, "The flame of combustible bodies may, in all cases, be considered as the combustion of an *explosive mixture* of inflammable gas or vapour with air. It cannot be regarded as a mere combustion at the surface of contact of the inflammable matter. This fact is proved by holding a taper, or a piece of burning phosphorus within a flame made by the combustion of alcohol. The flame of the taper, or of the phosphorus, will appear in the centre of the other flame, proving that there is oxygen even in its interior part.

Why does spirit of wine sometimes burn with various coloured flames?

Because of its admixture with different substances. Thus, from borax it acquires a *greenish yellow* tint; nitre, and the soluble salts of baryta, cause it to burn *yellow*, and those of strontia give it a beautiful rose colour; copper salts impart a fine *green*.

Dr. Ure, in his valuable *Dictionary of Chemistry*, (edit. 1830) gives the following recipe for the beautiful *red fire* now so effectively used to aid stage effect at the theatres:—40 parts dry nitrate of strontia, 13 parts finely powdered sulphur, 5 parts chlorate of potash, (hyper-oxymuriate) and 4 parts sulphuret of antimony.

Powder the two latter separately in a mortar, and then mix them on paper; after which add them to the other ingredients, previously powdered and mixed. No other kind of mixture than rubbing together on paper is required. Sometimes, a little realgar is added to the sulphuret of antimony; and frequently, when the fire burns dim and badly, a very small quantity of finely powdered charcoal, or lamp-black, will make it perfect.

Why is working in coal mines sometimes fatal to miners?

Because of the carburetted hydrogen gas, or damp, and noxious exhalations, during the working of the coals, from fissures or cracks in the beds; when this has accumulated so as to form one-thirteenth of the atmosphere of the mine, it becomes explosive by a lighted candle or any kind of flame. By miners, this gas is called *fire-damp*, to distinguish it from carbonic acid gas, which they call *choke-damp*.

The late Mr. Spedding, having observed that the explosive damp could only be kindled by flame, and was not liable to be set on fire by red-hot iron, nor by the sparks produced by the collision of flint and steel, invented a machine, in which, while a steel wheel was turned round with very rapid motion, flints were applied to it, and by the abundance of fiery sparks emitted, the miners were enabled to carry on their work in places where the flame of a lamp or candle would occasion dreadful explosions.

Why is the safety-lamp so called?

Because it consists of a lamp surrounded by a wire-gauze, which, by confining the flame from the fire-damp, without intercepting the light, enables the miners to work in safety; and which, in gratitude to its illustrious inventor, Sir H. Davy, is, in mining districts called *the Davy*.

Why does the wire-gauze prevent explosion?

Because the meshes of the gauze are of such a size that a flame of the gas attempting to pass through it, is so cooled by the heat-absorbing and heat-conducting power of the metal, as to be extinguished; or, in fewer words, the temperature of the flame is so much lowered as to be insufficient to ignite the inflammable mixture on the outside. This is shown by bringing down a piece of fine brass or iron wire-gauze upon the flame of a candle; or, what answers better, upon an inflamed jet of coal gas, it will, as it were, cut the flame in half. That the cooled gaseous matter passes through, may be shown by again lighting it upon the upper surface.

Mr. Brande further illustrates this principle, by supposing the flame of a common lamp to be everywhere properly surrounded with wire-gauze, and in that state immersed in an explosive gaseous mixture, (like the fire-damp) it will be inadequate to its inflammation; that part only being burned which is *within* the cage; communication to the inflammable air *without* being prevented by the cooling power of the metallic tissue; so that, by such a lamp, the explosive mixture will be consumed, but cannot be exploded.

The apertures in the gauze should not be more than one-twentieth of an inch square; in the working model which Sir Humphry Davy sent to the mines, there were 748 apertures in the square inch.

The above is the explanation of the principle, by, and from the reasonings of, the ingenious inventor himself.—Some facts known to Signor G. Libri, of Florence, were, however, at variance with this hypothesis, and he found, upon trial, that when single rods were made to approach a flame, the latter was always inflected on all sides from the rod, as if repelled by it; and that this effect was independent of the conducting power of the rod, whether good or bad. The amount of inflection or repulsion was directly as the mass, and inversely as the distance from the flame. It was not diminished by increasing the temperature of the rod even to such a degree as to render it scarcely possible for it to abstract any of the caloric. In fact, when two flames are made to approach each other there is a mutual repulsion, although their proximity increases the temperature, instead of diminishing it. From these principles, Signor L. says, the theory of the safety lamp is easily deduced. A metallic wire exerting, according to its diameter and its own nature, a constant repulsion upon flame, it is evident that two parallel wires so near each other as not to exceed the distance of twice the radius of the sphere of repulsion, will not permit a flame to insinuate itself between them, unless it be impelled by a force superior to the intensity of repulsion. If to these two wires others be added, a tissue is formed impenetrable to flame, especially when the conducting power of the wires adds its influence to that of the repulsion. He conceives that, from the views above stated, the number of cross or horizontal wires in Davy's lamps are unnecessarily large; and that by rejecting all of these excepting a number sufficient to secure the firmness of the tissue, the lamp would afford as great a security as at present, and, at the same time, diffuse a much greater light—this opinion he has verified by actual experiment.

Again, a Mr. Dillon, an ingenious writer on practical science, maintains, in opposition to Sir Humphrey Davy, that the Davy lamp acts by its heat and rarefaction, not from the flame being cooled by the wire-gauze covering. He shows, by a simple experiment, that the Davy lamp is not safe in a current of hydrogen, or carburetted hydrogen gas, which, if steadily directed on the flame of the lamp from a bladder and stop-cock, *by cooling the wire-gauze*, brings the flame of the lamp through the gauze to the mouth of the stop-cock, even should there be six folds of gauze intervening. He shows also, by immersing the lamp, when cold and newly-lighted, into a jar of dense hydrogen, or carburetted hydrogen gas, or an explosive mixture with atmospheric air, that explosion takes place inside and outside of the lamp; whereas, when the lamp has burnt sufficiently long to heat the wire-gauze, no explosion takes place on the outside of the lamp. These experiments appear incontrovertible in support of his theory, which is, "*that the wire-gauze is merely the rapid receiver and the retainer of heat, and that it is the caloric in its meshes which prevents the flame of the lamp from being fed by the oxygen of the atmosphere on the outside.*"

Mr. Dillon increases the heat of the lamp, and places on it a shield of talc to protect it from a current, and, upon his theory, the shafts or workings of iron and coal mines may be lighted with gas with perfect safety, protecting the flame with wire gauze and a circular shield of talc.

The explosions from fire-damp are truly terrific. Sir H. Davy says, "when this gas has accumulated in any part of the gallery or chamber of a mine, so as to be mixed, in certain proportions, with common air, the presence of a lighted candle, or lamp, causes it to explode, and to destroy, injure, or burn, whatever is exposed to its violence. The miners are either immediately killed by the explosion, and thrown, with the horses and machinery, through the shaft into the air, —the mine becoming, as it were, an enormous piece of artillery, from which they are projected—or, they are gradually suffocated, and undergo a more painful death, from the carbonic acid (*choke damp*) and nitrogen remaining in the mine after the explosion of the fire-damp; or what, though it appears the mildest, is perhaps the most severe fate,—they are burned or maimed, and often rendered incapable of labour, or of healthy enjoyment, for life."

A comparative statement has been made of the number of explosions in coal mines, and the deaths occasioned by them, during the ten years which preceded, and the ten years which succeeded, the introduction of the Davy-lamp; from which it appears that

From 1805 to 1816 there were	9 Explos.	284 Deaths.
1817 1823 - -	19	360
Excess since the introduction of the Davy	10	76

This excess is accounted for by the workmen relying so much on *the Davy*, that, under its protection, they now work in places where they would not have formerly ventured to take a light. Inattention to the state of the lamps doubtless contributes to the lamentable total.

Mr. Brande judiciously observes, that as their safety "entirely depends upon the perfect state of the wire-gauze, and upon the non-existence of any aperture or channel sufficiently large to admit of the passage of flame, they should, when in use in a coal mine, be inspected daily, to ensure their soundness in these respects. In gas-manufactories, spirit-warehouses, and in all cases where inflammable vapours or gases are likely to be generated, as in the examination of foul sewers and drains, it is obvious that these lamps are importantly applicable."

Why do firemen, by the protection of Aldini's incombustible cloth and wire-gauze, remain for two or three minutes completely enveloped in flames, without injury?

Because, perilous as their situation may appear, they are supplied in some way with pure air. M. Gay Lussac observes, that when a furnace is heated so as to flame and smoke, the air within is entirely deprived of oxygen; and therefore it is certain, that if the immediate action of the flames were guarded off by the wire-gauze, still it would be impossible to sustain respiration in the midst of them. There are several ways of accounting for the requisite supply of air; and one which M. Gay Lussac suggests appears the most probable:

viz. that the men are supplied by a current of fresh air from the space between the two garments. Besides this, we cannot suppose that their heads are constantly enveloped in the flames, and they, of course, find favourable moments for breathing; again, the power of suspending the breath is also an excellent resource, which every fireman ought by practice to acquire. The fireman has another difficulty to contend with, in the dense volumes of smoke, which prevent his breathing, blind his sight, and consequently retard his exertions. To obviate this, it has been proposed to furnish a supply of air from a portable reservoir; or by means of a flexible tube, rising from the feet to the mouth, through which the fresh air would naturally rise, as the heated air escaped above.—*Phil. Mag.* 1830.

Why does amàdou, or German tinder, readily inflame from flint and steel, or from the sudden condensation of air?

Because it consists of a vegetable substance found on old trees, boiled in water to extract its soluble parts, then dried and beat with a mallet, to loosen its texture; and lastly, impregnated with a solution of nitre. —*Ure.*

Why is a piece of paper lighted, by holding it in the air which rushes out of a common lamp-glass?

Because of the high temperature of the current of air above the flame, the condensation of which is by the chimney of the glass.

Why does heated platinum wire, if placed round the wick of a spirit-lamp, continue to give light and heat, though without flame?

Because of the vapour of the spirit; the heat never becoming sufficiently intense to produce its inflammation. This discovery, by Davy, ultimately gave rise to the formation of a lamp, which, containing alcohol, and prepared at the place of the wick with a piece of spongy platinum, or, as Dobereiner calls it, sub-oxide of platinum, or some other form of that metal, gradually converted the whole of the alcohol into acetic acid.

The lamp in this form has been used for a night-lamp: it gives light enough to see the time by a watch held close to it; and if more light be required, a piece of amàdou may be carefully inflamed at it, and then a light procured in the usual way. Mr. Batka proposes to use Eau de Cologne in place of common spirit of wine, and finds, that then the fragrance diffused is very grateful; being, in fact, occasioned by the actual formation of aromatic vinegar, during the whole time the lamp burns.

COMBUSTION.

Why are certain bodies combustible?

Because of an intense chemical action which takes place in them, and is connected with their electrical energies; "for, all bodies which powerfully act upon each other, are in the opposite electrical states of positive and negative; and the disengagement of heat and light, (which characterizes combustion) may depend upon the annihilation of those opposite states which happens whenever they combine."—*Brande.*

Sir H. Davy has asserted, "that in any case combustion is merely the appearance produced, when substances, which have perhaps still stronger attraction for each other than quick-lime and water, are combining chemically, so as to become heated, at least, to the degree of incandescence. During the phenomenon, there is not, as was formerly supposed, something altogether consumed and destroyed, or something called *plogiston* escaping; the substances concerned are but assuming a new form and arrangement.

Of the substances called combustible, there are only a few which will begin to unite or burn at the common temperature of our globe, the others requiring to be at some higher and peculiar temperature. Thus, phosphorus begins to burn at 150°, sulphur at 550°, charcoal at 750°, hydrogen at 800°; it appearing, that up to these temperatures, the attraction of the atoms among themselves is sufficient to resist the other attraction, or that of oxygen. But when the combustion once begins, the temperature, from the effect of the combustion itself, rises instantly, much beyond the degree necessary for the commencement of the process. Oxygen and hydrogen, which begin to burn or combine at 800°, produce a flame of as intense heat as human art can excite.—*Arnott.*

Why are other bodies, as a stone, or brick, termed incombustible?

Because, when heated, they undergo no change except an augmentation of temperature, and when left to themselves, they soon cool again, and become as at first. But, with combustible bodies, the case is very different. When heated to a certain degree in the open air, they suddenly become much hotter of themselves, and continue for a considerable time intensely hot, sending out a copious stream of caloric and light to the surrounding bodies. This emission, after a certain period, begins to diminish, and at last ceases altogether. The combustible body has now undergone a complete change,—it is converted into a substance possessing very different properties, and no longer capable of combustion.—*Thomson.*

Again, of substances burning in air, those which are originally aëriform, as coal gas, or which, on being heated are vapourised or rendered aëriform, before their union with the oxygen of the atmosphere takes place, as oil or wax, assume the appearance of flame; viz. the aëriform particles usually invisible, are raised to the incandescent temperature; but when the substance combining with the oxygen remains solid, while its particles are gradually lifted away by the oxygen acting only at the surface of their mass, it appears during the whole time only as a red-hot stone.

The latter is the case of charcoal, coke, Welch stone, coal, &c. while in the case of wood, common coal, &c. a greater or less portion of the inflammable matter, is, by the heat of the combustion, converted into vapour, and produces the beautiful appearance of flame.

Men, now grown familiar with prodigies, have almost ceased to be moved by them; but few persons can resist a feeling of wonder and admiration when chemistry, in its progress of discovery, every now and then calls forth the hidden spirit of combustion in some new or less familiar guise;—for instance, when a piece of iron wire, lighted as a taper in oxygen gas, burns with such resplendent brilliancy; or, when phosphorus, similarly placed, throws around its overpowering flood of flame; or, when small portions of the metal called potassium, being cast upon the surface of water, become as beads of most intense light, running about there, and crossing as in a merry dance;—or, lastly, when flames produced from particular substances are seen rising deep-tinged with most vivid and beautiful colours.—*Arnott.*

Why does a common fire smoke?

Because of the vapour of the water from the moisture of the fuel; and the carburetted hydrogen and bituminous substances, formed during combustion by the union of the hydrogen of the combustible with the oxygen of the atmosphere.

Why does a draught support a fire?

Because it flows towards the fire-place, to occupy the vacancy left by the air that has undergone decomposition, and which, in its turn, becomes decomposed also. Hence, a supply of caloric is furnished without intermission, till the whole of the combustible is saturated with oxygen.—*Parkes.*

Why do not coals, wood, &c. being combustibles, take fire on exposure to the air?

Because all such bodies require to have a certain preparatory temperature before beginning to combine with the oxygen of the atmosphere.

Why is heat produced by combustion?

Because of the decomposition of the oxygen gas of the atmosphere; for, as the oxygen combines with the combustible body, it disengages the caloric which is held when in the state of a gaseous substance. Or, to speak with more precision, the act of combustion effects a real analysis of atmospheric air; for while the oxygen combines with the combustible, the caloric, in the form of sensible heat, is thrown off in every direction.—*Parkes.*

Why do lamps with many wicks, placed near each other, give much more light than the same number of wicks would, if placed in separate lamps?

Because the light given out by a combustible body is in proportion to the elevation of temperature; and in this case the many wicks communicate heat to each other.

Why is oxygen a powerful supporter of combustion?

Because it is more abundantly diffused throughout nature than any of the other elementary bodies; it forms eight-ninths of the weight of water, about one-fifth of the weight of the atmosphere, and a relative proportion of the earthy and mineral bodies which form the solid matter of the globe. Hence, it is present everywhere, and ready to unite itself with any matter exposed to it at the necessary temperature.

Why is oxygen gas called vital air?

Because it is a powerful supporter of respiration. Thus, a small animal confined in oxygen gas, lives thrice as long as when confined in the same bulk of common air; but we are not thence to conclude that it is fit for the support of life; on the contrary, an animal made to breathe oxygen for any length of time, falls a sacrifice to excess of arterial action; and after death, the blood in the veins is found as florid as that in the arteries.—*Brande.*

Why is it considered that oxygen unites with the combustible body in the act of burning?

Because, if a substance be burnt in a sufficient quantity of oxygen gas, in a close vessel, and the product preserved, the whole will be found to be increased in weight exactly in proportion to the oxygen gas consumed, and the combustible body will then have become incombustible.—*Parkes.*

Fourcroy observes, " this view of combustion authorises us to divide almost all the productions of nature into two grand classes; one of combustible bodies, the other of bodies already *burnt;* in the masses and action of the former we discern the causes of inflammable meteors, the perpetual alteration of the surface of the earth, volcanoes, &c. In the existence of the latter we perceive the source of the number and diversity of acids, saline compounds, oxides, and metallic salts, which vary in a thousand ways the appearance of ores, &c."

Why is not a goblet, when pushed into water with the mouth downwards, filled with water?

Because the air in the goblet resists the entrance of the water; and, if the goblet be inverted over a floating lighted taper, this will continue to float under it, and to burn in the contained air, however deep in the water it be carried, exhibiting the curious phenomenon of a light below water, and itself an emblem of the living inmate of a diving bell, which is merely a larger goblet, with a man instead of a candle.—*Arnott.*

Why is the name fuel given only to the substances which combine with oxygen, and not to the oxygen itself?

Because, probably, the former being solid or liquid, and therefore more obvious to sense, were known as producers of combustion long before the existence of the aëriform ingredient was even suspected.—*Arnott.*

Why does a candle or lamp smoke?

Because the heat produced by it is not sufficient to effect the total combustion of the carbon, which rises in its flame.—*Arnott.*

SPONTANEOUS COMBUSTION.

Why are human bodies sometimes destroyed by spontaneous combustion?

Because of a new arrangement of the muscles, tendons, viscera, &c.; or new products originating from their degeneration.

Numerous instances of this mortal catastrophe are recorded. M. Julia de Fontenelle, in a paper lately read to the Academy of Sciences at Paris, describes fifteen cases, from the details of which the following general results are obtained:—

1. Generally those who have died by spontaneous combustion, have indulged in excess of spirituous liquors. 2. The combustion is almost always general, but in some cases it may be partial. 3. It is rare amongst men; and the women have in almost every case been aged. 4. The body and the viscera have always been burnt, whilst the feet, hands, and crown of the head have almost always been saved. 5. Although it is known by experience that a very large quantity of wood is requisite to burn a corpse, this particular kind of incineration occurs without inflaming the most combustible substances of an ordinary kind near it. 6. It has not been shown, in any case, that the presence of fire is necessary to commence this kind of combustion. 7. Water, instead of extinguishing the flame, appears to give it more activity; and when the flame has disappeared, the combustion proceeds within. 8. They occur more frequently in winter than in summer. 9. The cure of general combustions has never been effected; but sometimes that of partial ones. 10. Those seized with combustion experience a sensation of strong internal heat. 11. It

is suddenly developed, and consumes the body in a few hours. 12. Those parts not reached by the fire, are affected by gangrene. 13. A putrid degeneration ensues, which causes gangrene. 14. The residue of this combustion is composed of greasy cinders, and an unctuous matter.

Professor Jameson observes, in substance, upon this interesting question: "we are of opinion that, in some subjects, and chiefly in women, there exists a general condition of the body, which, conjoined with the extreme debility occasioned by age, a life of little activity, and the abuse of spirituous liquors, may give rise to a spontaneous combustion. But we are far from considering as the material cause of this combustion, either alcohol, or hydrogen, or a superabundance of fat. If alcohol plays a prominent part in this combustion, it is by contributing to its production: that is to say, it produces, along with the other causes mentioned, the degeneration of which we have spoken, which gives rise to new products of a highly combustible nature, the reaction of which determines the combustion of the body."

A curious case of the combustion of both hands only, in which the patient recovered, is related in the *Medical Journal*, 1830.

CHARCOAL.

Why do various woods afford different quantities of charcoal?

Because of their different durability; those most abundant in charcoal and earthy matter are the most permanent; while those that contain the largest portion of the gaseous elements are the most perishable. Among British trees, the chestnut and oak are the most permanent, and the chestnut affords rather more charcoal than the oak.

The beams of the theatre at Herculaneum were converted into charcoal by the lava which overflowed that city; and during the lapse of seventeen hundred years the charcoal has remained as entire as if it had been formed but yesterday; and it will probably continue so to the end of the world. The incorruptibility of charcoal was known in the most ancient times: the famous temple at Ephesus was built upon wooden piles, which have been charred on the outside, to preserve them.—*Watson's Chemical Essays.*

A new process for manufacturing charcoal, is to fill all the interstices in the heap of wood to be charred, with powdered charcoal; the product is equal in quality. The effect is produced by preventing much of the access of air which occurs in the ordinary method. The volume of charcoal is increased a tenth, and its weight a tenth.—*Bullétin Universel,* 1830.

Professor Silliman, in his Journal, (1830) says, that in the United States, wood is charred in brick-kilns, with openings at the top and sides, under regulation; and the charcoal thus obtained is exceedingly good, and more abundant than by the old mode of burning.

Wood has also been charred at low temperatures. Thus, on making extracts, in wooden vessels, with steam of very moderate pressure, all the apparent effects of burning may be produced; but the carbonization of the wood is not so complete as by flame. This fact is practically illustrated in the *Philosophical Magazine,* 1830.

The application of charcoal to various purposes of domestic economy has been already noticed in Part I of the present work.*

Why does heated charcoal produce combustion?

Because the mutual cohesion of its particles is so weakened, that is, the particles are so repelled and separated from each other, that their attraction for the oxygen in the air around is allowed to operate, and they combine with that oxygen, so as to produce the above phenomenon.

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* See DOMESTIC SCIENCE, p. 6.

Why does charcoal increase in weight on exposure to the air after burning?

Because it is a very hygrometric substance, and therefore absorbs air and moisture in considerable quantity.—*Brande.*

Why do sailors at sea throw pieces of burnt biscuit in bad water?

Because it serves as charcoal in destroying the putrid flavour of the water, and rendering it comparatively fresh.

Why does fresh charred wood, or charcoal, improve the flavour of spirits?

Because it destroys the essential oil, or empyreumatic flavour which the spirit may have contracted in distillation.

GUNPOWDER.

Why do mixed nitre, sulphur, and charcoal, or gunpowder, explode with heat; whereas, while cold, they may be mixed together most intimately without any change?

Because, by the change of temperature, and the consequently altered relative attractions of the different substances, a new chemical arrangement of them takes place with the intense combustion and expansion which constitute the explosion.

The proportions of the ingredients of gunpowder vary. The following are those usually employed—

	Common Powder.	Shooting Powder.	Shooting Powder.	Miners Powder.
Saltpetre	75.0	78	76	65
Charcoal	12.5	12	15	15
Sulphur	12.5	10	9	20

The latter contains the smallest quantity of saltpetre, as it requires less quickness or strength. The ingredients are *perfectly* mixed, moistened, beaten into a cake, which is afterwards broken up, granulated, dried, and for the finest powder, polished by attrition. —*Brande.*

Why is iron excluded from powder works?

Because it is liable to cause sparks by a blow. Brass and copper have been recommended in its place; but Col. Aubert has remarked that brass can inflame powder, and has made experiments on the subject before a committee, the result of which is as follows:—Inflammation of the powder takes place when the blow is given by iron against iron; iron against brass; brass against brass: iron against marble; lead against lead, or against wood, when the blow is produced by a leaden ball shot from a fire-arm. As yet, powder has not been inflamed by the blow of an iron hammer against lead or wood.—*Bulletin Universel.*

Why is steam likely to supersede gunpowder in the discharge of artillery?

Because the elastic force of high-pressure steam having much greater range than that of gunpowder, is infinitely better calculated for projectiles, independently of any saving of expense. It is estimated by Mr. Perkins, that the projectile force of steam is ten times greater than that of gunpowder, in throwing a ball to a given distance.

Why do "Prometheans" suddenly inflame on pressure?

Because they consist of small glass bulbs, filled with concentrated sulphuric acid, hermetically sealed, and surrounded with a mixture of inflammable materials, amongst which the chlorate of potash forms one; and the whole being again inclosed or surrounded with paper, also rendered still more inflammable by means of resinous matters. Upon pinching the end containing the glass bulb, between the jaws of a pair of pliers, the bulb breaks, and the sulphuric acid instantly kindles the surrounding materials.

VOLCANIC FIRE.

Why are volcanoes produced?

Because, according to the most recently observed phenomena, they "depend upon the oxidation of the metals of the earths upon an extensive scale, in immense subterranean cavities, to which water or atmospheric air may occasionally have access. The subterranean thunder heard at great distances under Vesuvius, prior to an eruption, indicates the vast extent of these cavities; and the existence of a subterranean communication between the Solfatarra and Vesuvius, is established by the fact that whenever the latter is in an active state, the former is comparatively tranquil. In confirmation of these views, the author remarks, that almost all the volcanoes of considerable magnitude in the old world, are in the vicinity of the sea; and in those where the sea is more distant, as in the volcanoes of South America, the water may be supplied from great subterranean lakes; for Humboldt states that some of them throw up quantities of fish."

The phenomena observed by the author afford a sufficient refutation of all the ancient hypotheses, in which volcanic fires were ascribed to such chemical causes as the combustion of mineral coal, or the action of sulphur upon iron; and are perfectly consistent. The author acknowledges, however, that the hypothesis of the nucleus of the globe being composed of matter liquified by heat, offers a still more simple solution of the phenomena of volcanic fires.—*Sir H. Davy, Philosophical Transactions.*

On these phenomena, Baron Humboldt says, "Observations made in all countries, in mines and caves, prove that, even at a small depth, the earth's heat is much superior to the temperature of the surrounding atmosphere. A fact so remarkable, and elicited from observations made in almost every part of the globe, connects itself with what we learn of the phenomena of volcanoes. La Place has even attempted to determine the depth at which the earth may be considered as a melted mass. Whatever doubts may be entertained, notwithstanding the respect due to so great a name, as to the numerical accuracy of such a calculation, it is not the less probable, that all volcanic phenomena arise from a single cause, which is the communication constant or interrupted, that exists between the interior of our planet and the external atmosphere. Elastic vapours, by their pressure, raise through deep crevices the substances which are in a state of fusion, and which are oxidized. Volcanoes are, so to speak, entermittent springs of earthy matters. The fluid mixtures of metals, alkalies and earths, which condense into currents of lava, flow gently and slowly, when, on being raised up, they once find an issue.

Why does water appear necessary to produce volcanic fire?

Because the most active volcanoes are in the immediate vicinity of the sea; some are actually beneath the sea; and only extinct volcanoes are found far inland.

Why are earthquakes and volcanoes supposed to be of the same origin?

Because of the frequency of earthquakes in volcanic countries; and when they occur in non-volcanic countries, remote from volcanic fires, or their occurrence, the coincidence of distant volcanic eruptions. It is a remarkable circumstance, also, that the shocks of earthquakes are most severe in non-volcanic countries, such as Lisbon and the Caraccas.—*Notes in Science.*

Why do hot springs occur in the very vicinity of all active volcanoes?

Because, probably, such waters owe their temperature to their passage through channels heated by volcanic fire.—*Berzelius.*

Why do volcanoes throw out pumice stone?

Because the light-coloured, or whitish porous lavas, becoming fibrous, pass into the above light spongy stone.

Why is pumice stone sometimes seen floating on the sea?

Because it is produced by submarine volcanoes, that break out at such vast depths under the ocean, that none of their products reach the surface, except such as are lighter than water. Pumice has been seen floating upon the sea over a space of three hundred miles, at a great distance from any volcano.

Why is puzzolano used for building in water?

Because, when mixed with lime, it speedily fixes itself, and the water does not soften it, for it becomes continually harder and harder. The lime found abundantly at Dorking, in Surrey, has a similar property of hardening under water.

END OF PART V.

KNOWLEDGE FOR THE PEOPLE:

OR THE

PLAIN WHY AND BECAUSE.

PART VI.—SPORTS AND PASTIMES.

SPORTS AND PASTIMES.

HUNTING.

Why is it inferred that hunting was practised by the ancient Britons?

Because Dionysius (who lived 50 B. C.) says, that the inhabitants of the northern part of this island tilled no ground, but lived in great part upon the food they procured by hunting. Strabo (nearly contemporary) also says, that the dogs bred in Britain were highly esteemed upon the continent, on account of their excellent qualities for hunting.

Cæsar tells us, that venison constituted a great portion of their food; and as they had in their possession such dogs as were naturally prone to the chase, there can be little doubt that they would exercise them for procuring their favourite diet; besides, they kept large herds of cattle and flocks of sheep, both of which required protection from the wolves and other ferocious animals that infested the woods and coverts, and must frequently have rendered hunting an act of absolute necessity.—*Strutt.*

Absenteeism has, of course, contributed much to the decay of field sports in England. This occasioned a celebrated politician to say, " he would willingly bring in one bill to make poaching felony; another to encourage the breed of foxes; and a third to revive the decayed amusements of cock-fighting and bull-baiting

—that he would make, in short, any sacrifice to the humours and prejudices of the country gentlemen, in their most extravagant form, providing only that he could prevail upon them to dwell in their own houses, be patrons of their own tenantry, and the fathers of their own children."—*Quarterly Review*, No. 74.

Why is hunting considered more ancient than hawking?

Because, in the earliest ages of the world, hunting was a necessary labour of self-defence, or the first law of nature, rather than a pastime; while hawking could never have been adopted from necessity, or in self-protection.

Strutt tells us, that the earliest among the treatises on hunting that he has met with, is dated early in the fourteenth century; and that hawking most commonly forms a part of these treatises; and, though this practice can only be considered as a modern invention comparatively with hunting, yet it has obtained the precedence.

Upon the antiquity of hunting there is a coincidence in the sacred scriptures and the fabulous traditions of the poets. Thus, we read in the former, that Nimrod was "a mighty hunter before the Lord." Hunting, proscribed in the book of Moses, is apotheosized in mythology, under the tutelage of Diana.

Why was hunting originally considered a royal and noble sport?

Because, as early as the ninth century, it formed an essential part of the education of a young nobleman. Alfred the Great was an expert and successful hunter before he was twelve years of age. Among the tributes imposed by Athelstan, upon a victory over Constantine, King of Wales, were, "hawks and sharp-scented dogs, fit for hunting of wild beasts." Edward the Confessor "took the greatest delight to follow a pack of swift hounds in pursuit of game, and to cheer them with his voice."—*Malmesbury*. Harold, his successor, rarely travelled without his hawk and hounds. William the Norman, and his immediate successors, restricted hunting to themselves and their favourites. King John was particularly attached to field sports, and even treated the animals worse than his subjects. In the reign of Edward II, hunting was reduced to a perfect science, and rules established for its practice; these were afterwards extended by the *master of the game* belonging to Henry IV, and drawn up for the use of his son, Henry Prince of Wales, in two tracts, which are extant. Edward III, according to Froissart, while at war with France, and resident there, had with him sixty couple of stag-hounds, and as many hare-hounds, and every day hunted or hawked. Gaston, Earl of Foix, a foreign nobleman, contemporary with Edward, also kept 600 dogs in his castle for hunting. James I. preferred hunting to hawking or shooting; so that it was said of him, "he divided his time betwixt his standish, his bottle, and his hunting; the last had his fair weather, the two former his dull and cloudy."

The bishops and abbots of the middle ages hunted with great state, and some of them were skilful sportsmen. Walter, Bishop of Rochester, in the 13th century, hunted at the age of fourscore, to the total neglect of his episcopal duties; and in the succeeding century, an abbot of Leicester surpassed all the sportsmen of his time in hare-hunting; and these dignitaries even travelled from place to place upon affairs of business, with both hawks and hounds in their train.

In former times the ladies often joined hunting parties, and had parties among themselves. Queen Elizabeth was extremely fond of the chase, and hunted at the age of 77; and an author of the seventeenth century speaks of certain fair huntresses of Bury, in Suffolk, who equipped themselves for the chase entirely as men; a custom, we may add, "more honoured in the breach than the observance." Still, they uniformly wore habits, as in the present day.

Ladies' hunting dresses, of the fifteenth century, as figured in Strutt's Sports, &c. differ but little from the modern riding habit.

According to the ancient books of the practice of sportsmen, the seasons for hunting were as follows:—The time of grace begins at Midsummer, and lasteth to Holyrood day (14th September). The fox may be hunted from the Nativity to the Annunciation of our Lady (25th March); the roe-buck from Easter to Michaelmas; the roe from Michaelmas to Candlemas (Feb. 2.); the hare from Michaelmas to Midsummer. The wolf, as well as the fox and the bear, from the Nativity to the Purification of our Lady, (Feb. 2.)

Why are greyhounds still petted by ladies?

Because in former times they were considered as valuable presents, especially among the ladies, with whom they appear to have been peculiar favourites. In an ancient metrical romance (Sir Eglamore), a princess tells the knight, that if he was inclined to hunt, she would, as an especial mark of her favour, give him an excellent greyhound, so swift that no deer could escape from his pursuit.—*Strutt.*

Why were certain forests called royal chases?

Because the privileges of hunting there were confined to the king and his favourites; and, to render these receptacles for the beasts of the chase more capacious, or to make new ones, whole villages were depopulated, and places of divine worship overthrown; not the least regard being paid to the miseries of the suffering inhabitants, or the cause of religion.—*Strutt.*

Blount tells us that there formerly existed a very cruel law, which subjected all the dogs that were found in the royal chases and forests, excepting such as belonged to privileged persons to be maimed, by having the left claw cut from their feet, unless they were redeemed by a fine. This law probably originated with the Normans, and certainly was in force in the reign of Henry I.

Why were lands first imparked?

Because their owners might still more effectually preserve deer and other animals for hunting. Stowe tells us, that the park at Woodstock, in Oxfordshire, seven miles in circumference, and walled round with stone by Henry II. was the first made in England. The royal example was first followed by Henry Earl of Warwick, who made a park at Wedgenoke, near Warwick; after which, the practice of park-making became general among persons of opulence.

A recent French newspaper gave notice of an association for the purpose of enabling persons of all ranks to enjoy the pleasure of the chase. A park of great extent is to be taken on lease near Paris; its extent is about 6000 acres, partly arable, and partly forest ground. The plan is, to open it to subscribers during six months, viz. from September 1 to March 1, an ample stock of game being secured in preserves.

Why were parks and inclosures usually attached to priories?

Because they were receptacles of game for the clergy of rank, who at all times had the privilege of hunting in their own possessions. At the time of the Reformation, the see of Norwich only was in the possession of no less than thirteen parks, well stocked with deer and other animals for the chase.—*Spelman.*

The eagerness of the clergy for hunting is described as irrepressible. Prohibitions of councils produced little effect. In some instances a particular monastery obtained a dispensation. Thus, that of St. Denis, in 774, represented to Charlemagne that the flesh of hunted animals was salutary for sick monks, and that their skins would serve to bind books in the library.

Alexander III, by a letter to the clergy of Berkshire, dispenses with their keeping the archdeacon in dogs and hawks during his visitation.—(*Rymer.*) An archbishop of York, in 1321, carried a train of 200 persons, who were maintained at the expense of the abbeys on his road, and who hunted with a pack of hounds from parish to parish!—*Whitaker's Hist. of Craven*, quoted in *Hallam's Hist. Middle Ages.*

Why was hunting formerly a very convenient resource for the wholesomeness, as well as luxury, of the table?

Because the natural pastures being then unimproved, and few kinds of fodder for cattle discovered, it was impossible to maintain the summer stock during the cold season. Hence a portion of it was regularly slaughtered and salted for winter provision. We may suppose, therefore, that when no alternative was offered but these salt meats, even the leanest venison was devoured with relish.—*Hallam's Hist. Middle Ages.*

Why were all the great forests pierced by those long rectilinear alleys which appear in old prints, and are mentioned in old books?

Because the avenues were particularly necessary for those large parties, resembling our modern *battues*, where the honoured guests being stationed in fit *standings*, had an opportunity of displaying their skill in venery by selecting the buck which was in season, and their dexterity at bringing him down with the cross-bow or long-bow.

Lord Herbert of Cherbury, in his description of Chantilly, speaks of a forest, which, "being of a very large extent, and set thick both with tall trees and underwood, was replenished with wild boar, stags and roe-deer, and was cut into long walks every way, so that although the dogs might follow their chase through the thickets, the huntsmen might ride along the said walks, and meet or overtake their game in some one of them, they being cut with that art, that they led to all the parts in the said forest."

Why should a deer-park exhibit but little artificial arrangement in its disposal?

Because the stag, by nature one of the freest denizens of the forest, can only be kept even under comparative restraint, by taking care that all around him intimates a complete state of forest and wilderness. Thus, there ought to be a variety of broken ground, of copse-wood, and of growing timber—of land, and of water. The soil and herbage must be left in its natural state; the long fern, amongst which the fawns delight to repose, must not be destroyed.

Why did the common people formerly call the forest "good," and the greenwood "merry?"

Because of the pleasure they took in the scenes themselves, as well as in the pastimes which they afforded.

Why is a short gallop called a canter?

Because of its abbreviation from Canterbury, the name of the pace used by the monks in going to that city.

Why was a certain noise called the "hunt's-up"?

Because it was made to rouse a person in a morning; originally a tune played to wake the sportsmen, and call them together, the purport of which was, *The hunt is up!* which was the subject of hunting ballads also.

This expression is common among the older poets. One Gray, it is said, grew into good estimation with Henry VIII. and the Duke of Somerset, "for making certaine merry ballades, whereof one chiefly was, the *hunte is up, the hunte is up!*" Shakspeare has,

Since arm from arm that voice doth us affray,
Hunting thee hence with *hunts-up* to the day.
Romeo and Juliet.

Again, in Drayton's *Polyolbion:*

No sooner doth the earth her flow'ry bosom brave,
At such time as the year brings on the pleasant spring,
But *hunts-up* to the morn the feather'd sylvans sing.

Why is a small hunting horn called a bugle?

Because of its origin from *bugill*, which means a buffalo, or perhaps any horned cattle. In the Scottish dialect it was *bogle*, or *bowgill*. *Buffe, bugle, and buffalo*, are all given by Barrett, as synonymous for the wild ox.—*Nares' Glossary.*

Why is the stirrup so called?

Because of its origin from *stigh-rope*, from *stigan ascendere*, to mount; and thus termed by our Saxon ancestors, from a rope being used for mounting when stirrups began to be used in this island. It is evident, from various monuments of antiquity, that, at first, horsemen rode without either saddles or stirrups.

Why are sportsmen said to hunt counter?

Because they hunt the wrong way, and trace the scent backwards. Thus, in an old work, *Gentleman's Recreations*: "When the hounds or beagles hunt it by the heel, we say they hunt counter." To hunt by the heel must be to go towards the heel instead of the toe of the game, *i. e.* backwards.—*Nares.*

Why were wolves extirpated much sooner in England and Wales, than in any other country of Europe?

Because many tributes were paid, and tenures held, by the annual production of a certain number of wolves' skins. Thus, the Welsh paid tribute to King Edgar, in the tenth century, which he commuted for 300 wolves' heads. Malmesbury says, the tribute ceased on the fourth year for want of wolves. In England, in 10th William I, Robert de Unfranville, knight, held the lordship of Riddesdale, in the county of Northumberland, by service of defending that part of the country from enemies and *wolves*. Fitzstephen does not mention that wolves existed in his time in the great forest north of London. Edward I, however, issued his edict to "Maister Peter Corbet" to superintend their destruction. In 43d Edward III, Thomas Engaine held lands in Pitchley, Northampton, by service of finding, at his own cost, certain dogs for the destruction of wolves, foxes, &c. in the counties of Northampton, Rutland, Oxford, Essex, and Buckingham; and as late as the 11th year of Henry VI, Sir Robert Plumpton held land in the county of Nottingham, called *wolf-hunt land*, by service of winding a horn, and chasing or frighting the wolves in the forest of Shirewood.—See more in *Blount's Ancient Tenures.*

For a variety of information respecting wolves, dogs, and hunting generally, we refer the reader to Part II. of the present work,—*Quadrupeds*, p. 19 to 24.

Why is hare-hunting comparatively of modern date?

Because, in early times, the Britons did not eat the flesh of hares, notwithstanding the island abounded with them; which abstinence arose from a principle of religion.—*Cæsar.*

Strutt adds, "which principle, no doubt, preserved them from being worried to death; a cruelty reserved for more enlightened ages."

Hares are extremely interesting in their melancholy characteristics. They are so timid as to be fascinated by fear: even a falling leaf disturbs them. They live in solitude and silence, except occasionally assembling by moonlight to sport together, when their savage enemies are asleep. Their cries, when taken, resemble those of an infant; but this appeal to man, though in the semblance of his own nature, is ineffectual. Cowper domesticated three hares, and his account of them is full of pathos and fine feeling: what congenial companions must they have been in his melancholy musings. Who does not remember, in his epitaph on a hare:

> I kept him for his humour's sake,
> For he would oft beguile
> My heart of thoughts that made it ache,
> And forc'd me to a smile.

Thomson says,

> Poor is the triumph o'er the timid hare:

—a sentiment but ill responded in his epicurism. The analogous sensibilities of the hare may be carried to better account: timid men in the world, resemble hares in the chase.

Why was "a hart of ten" so called?

Because he was past his sixth year, and had ten branches on his horns.

Why is the cry of the deer called "bell"?

Because of its abbreviation from the word bellow. In an ancient inscription on the house of Wharncliff, we are informed that the lodge was built in Henry the Eighth's time by one gentle knight, Sir Thomas Wortley, that he might hear the buck *bell* in the summer season,—a simple record which speaks much to the imagination.

Why was the fine called "white hart silver," imposed?

Because Henry II. and his retinue having, in the chase just mentioned, run over and spoiled the lands of Thomas de la Linde, and refusing to make good the injury, De la Linde, and others, by way of revenge, ran down and killed the king's favourite hart, and making merry over its haunches, spoke disrespectfully of their sovereign. Upon this reaching the ears of the king, he made every one concerned in the death of the royal animal pay into the exchequer an annual fine called "White Hart silver," which was not remitted during the reign of that monarch.

Why is a white hart, with a collar, so common as an inn sign throughout England?

Because Henry II, one day in Blackmoor forest, started a milk-white hart, which afforded the king and his train so much sport, that at the pulling down it was the royal pleasure to save the beast, and place round his neck a collar of brass, on which was engraved "I am a royal hart, let no one harm me."

Another explanation of the hart wearing a metal collar is traced to the stag said to have been taken in the forest of Senlis, by Charles V, about the neck of which was a collar with the inscription,

"Cæsar hoc mihi donavit;"

which induced a belief that the animal had lived from the reign of some of the twelve Cæsars. This inscription also exists in the following form:—

Tempore, quo Cæsar Româ, dominatus in altâ
Aureolo jussit collum signare moniti;
Ne depascentem quisquis me gramina lædat,
Cæsaris heu causâ, perituræ parcere vitæ;

which has been thus translated:—

"When *Julius* Cæsar reigned king,
About my neck he put this ring;
That whosoever did me take,
Should spare my life for Cæsar's sake."

It appears, however, that *Julius* Cæsar is gratuitously preferred by the English paraphrist, nothing appearing in the original inscription to determine its reference more to Julius Cæsar than to Domitian. On the Dorchester road from Sturminster, we are informed there is, or recently was, a public house called "The King's Stag;" its sign displaying a stag with a gold collar round its neck, with nearly the above subscription.

Why was the Common Hunt established in the City of London?

Because of a charter granted by Henry I. to the citizens, to "have chases, and hunt as well and as fully as their ancestors have had; that is to say, in the Chiltre, in Middlesex, and Surrey."—(*Maitland.*) Fitzstephen (Henry II.) says, that "the Londoners delight themselves with hawks and hounds; for they have the liberty of hunting in Middlesex, Hertfordshire, all Chiltern, and in Kent to the waters of Grey," which differs somewhat from the charter. These exercises were not much followed by the citizens of London at the close of the sixteenth century; not for want of taste for the amusement, but for leisure to pursue it. (*Stow.*) Strype, however, so late as the reign of

George I., reckons among the modern amusements of the Londoners, "riding on horseback, and hunting with my Lord Mayor's hounds, when the *common hunt* goes out."

Why was the Epping Hunt first appointed?

Because of a privilege granted to the citizens to hunt, with other places, in Hainault Forest, of which Epping Forest is part.

The Common Hunt of the City is ridiculed in an old ballad, in D'Urfey's "Pills to purge Melancholy," 1719; in which he thus characterizes the Lord Mayor:—

> My lord he takes a staff in hand to beat the bushes o'er,
> I must confess it was a work he ne'er had done before;
> A creature bounceth from a bush which made them all to laugh,
> My lord he cried "a hare, a hare," but it proved an Essex calf.

The "Hunt" has not "'scap'd whipping" even in our times, in the ballad entitled "The Epping Hunt," by the facete Thomas Hood.

Why are certain terms used exclusively by sportsmen?

Because of their origin from a peculiar kind of language invented by the sportsmen of the middle ages, which it was necessary for every lover of the chase to be acquainted with. Thus, when beasts went together in companies, there was said to be a herd of harts, of bucks, and all sorts of deer; a bevy of roes; a slott of bears; a singular of boars; a sownder of wild swine; a dryft of tame swine; a route of wolves; a harras of horses; a rag of colts; a stud of mares; a pace of asses; a barren of mules; a team of oxen; a drove of kine; a flock of sheep; a tribe of goats; a skulk of foxes; a cete of badgers; a richess of martins; a fesignes of ferrets; a huske or a down of hares; a nest of rabbits; a clowder of cats, and a Kendal of young cats; a shrewdness of apes; and a labour of moles. And also of animals when they retired to rest; a hart was said to be harbored, a buck lodged, a roe-buck bedded, a hare formed, a rabbit set, &c. Two greyhounds were called a brace, three a leash; but two spaniels or harriers were called a couple. We have also a mute of hounds for a number, a kennel of raches, a litter of whelps, and a cowardice of curs.—*Strutt.*

HAWKING.

Why is hawking generally placed at the head of rural amusements?

Because of its being so generally followed by the nobility, not only in this country, but also on the continent. In olden times, persons of high rank rarely appeared without their dogs and their hawks; the latter they carried with them when they journeyed from one country to another; and sometimes even when they went to battle, and would not part with them even to procure their own liberty when taken prisoners. These birds were considered as ensigns of nobility; and no action could be reckoned more dishonourable to a man of rank, than to give up his hawk. Upon the tapestry of Bayeaux, Harold is represented approaching the Duke of Normandy, with his hawk upon his hand. Sometimes hawks formed part of the train of an ecclesiastic: Becket had hawks and hounds of every description with him, when he went to the Court of France, as ambassador from England. Females of distinction were, occasionally represented with hawks on their hands, as we know, from an ancient sculpture, in the Church of Milton-Abbey, where the consort of King Athelstan appears, with a falcon on her fist, tearing a bird. The Welsh had a saying in very early times, that "you may know a gentleman by his hawk, horse, and greyhound." Alfred the Great is said to have written a treatise on hawking; and from various sources the pastime may be traced in high favour, to the end of the Saxon era. —*Strutt.*

In the fields, and open country, hawking was followed on horseback; and on foot, when in the woods and coverts. In the latter case the sportsman had with him a stout pole, to assist him in leaping over rivulets and ditches; and we learn from Hall, the chronicler, that Henry VIII, pursuing his hawk on foot, at Hitcham, in Hertfordshire, was plunged into a deep slough, by the breaking of his pole, and would have been stifled but for prompt assistance.

We may gather some idea of the value attached to hawks, and the prices given for them,—from the laws enacted for their preservation. Each species of bird seems to have had its rank of patron; and Strutt quotes from the book of St. Alban's (so called from its being printed at St. Alban's) the sort of birds assigned to the different ranks of persons, in the following order:—

> The eagle, the vulture, and the melona, for an emperor.
> The ger-falcon, and the tercel of the ger-falcon for a king.
> The falcon gentle, and the tercel gentle for a prince.
> The falcon of the rock for a duke.
> The falcon peregrive for an earl.
> The bastard for a baron.
> The sacre and the sacret for a knight.
> The lanere and the laneret for an esquire.
> The marlyon for a lady.
> The hobby for a young man.
> The gos-hawk for a yeoman.
> The tercel for a poor man.
> The sparrow-hawk for a priest.
> The musket for a holy-water clerk.
> The nesterel for a knave or a servant.

The prevalence of inclosures has made hawking almost impossible in most parts of England. Latterly, however, the Duke of St. Alban's, hereditary Grand Falconer, has imported hawks from Germany, and has attempted to revive the noble art of falconry. Some of these experiments have been made upon his Grace's estate in Lincolnshire, but with little of the glory of the olden sport.

It may, however, be interesting to know, that Sir John S. Sebright, Bart. has very recently published a pamphlet upon hawking, which details the best method of taking, rearing, and training the hunting hawks, with all the terms of falconry; including feeding, tiring, &c.; with descriptions of their game, and directions for using them in the pursuit of it.

Why have the ancient English illuminators uniformly represented King Stephen with a hawk upon his hand?

Because, by that symbol, it is presumed they intended to signify that Stephen was nobly, though not royally, born. The same reason will hold good respecting the representation of Harold, just mentioned. —*Notes to Strutt.*

Why was it formerly illegal to take a hawk's nest?

Because the bird was so highly esteemed by the nobility of England.

In the 11th Henry VII, it was deemed, "That if any person was convicted of taking from the nests, or destroying the eggs of a falcon, a gos-hawk, a laner, or a swan, he should suffer imprisonment for one year and one day, and be liable to a fine at the King's pleasure; one half of which belonged to the Crown, and the other half to the owner of the ground whereon the eggs were found;" and if a man destroyed the same sort of eggs upon his own ground, he was equally subject to the penalty. This act was somewhat ameliorated in the reign of Elizabeth, and the imprisonment reduced to three months; with security for good behaviour for seven years.

Why was the female usually preferred in hawking?

Because she is much more courageous than the male.

Some of the falcon tribe, it may be here observed, have been used for hunting hares, deer, &c. Mr. Southey alludes to this sport in *Thalaba:—*

> The deer bounds over the plain:
>   The lagging dogs behind,
>   Follow from afar!
> But, lo! the Falcon o'er head
>   Hovers with hostile wings,
> And buffets him with blinding strokes.

Why was the slight falcon called one of "the lure"?

Because, being a long-winged hawk, it was flown, to lure other birds.

Why was the gos-hawk called one of "the fist"?

Because it was carried upon the hand, with straps of silk or leather, called jesses, about its legs; the jesses being made sufficiently long for the knots to appear between the little and middle finger of the hand that held them, so that, the small thongs of leather might be fastened to them with two strings; and the thongs were loosely wound round the little finger: lastly, each leg was adorned with a bell, fastened with rings of leather, to which was added, a long thread, by which the bird, in tutoring, was drawn back, after she had been permitted to fly; and this was called reclaiming the hawk. These threads were useful to keep the hawk from winding 'when she bated,' that is, when she fluttered her wings to fly after her game. The person who carried the hawk was also provided with gloves, to prevent the talons from hurting his hand. In the inventories of apparel belonging to Henry VIII, such articles frequently occur. At Hampton-Court, in the Jewel-house, were seven hawks' gloves, embroidered.—*Abridged from Strutt.*

Why were the bells made at Milan the best for gos-hawks?

Because, says Strutt, "they were commonly sounded with silver, and charged for accordingly." Strutt adds in a note, "I am told that silver being mixed with the metal, when the bells are cast, adds much to the sweetness of the sound," and hence, probably, the allusion of Shakspeare, when he says,

How silver sweet sound lovers' tongues by night.

Why was a hawk said to be whistled off?

Because hawks were usually sent off with a whistle, against the wind, when sent in pursuit of prey; with it, or down the wind, when turned loose, and abandoned. Thus

> If I do prove her haggard,
> Though that her jesses were my dear heart strings,
> I'd *whistle her off*, and let her down the wind,
> To prey at fortune. *Othello.*

The hawk was called back to the hand by the same signal:

> If you can whistle her
> To come to fist, make trial, play the young falconer. *Old Play.*

Sir Thomas Browne has written a Tract "Of Hawks and Falconry, Ancient and Modern," in which he illustrates the economy of the birds with great minuteness. He says, "They carried their hawks in the left hand, and let them fly from the right. They used a bell, and took great care that their jesses should not be red, lest eagles should flie at them." The ancient recreation "seemed more solemn and sober than ours at present, so improperly attended with oaths and imprecations. For they called on God at their setting out."—*Folio edit.* 1686.

Why was it believed by the old naturalists that hawks and other birds of prey did not drink?

Because all birds of prey are capable of sustaining the want of food and water for *long periods*, particularly the latter; but of which they also seem remarkably fond, drinking frequently in a state of nature, and during summer washing almost daily: the error must, therefore, have arisen from imperfect observation of their habits. Sir Thomas Browne, who quotes Aristotle in this error, says, "although it will not strictly hold, yet I kept an eagle two years, which fed upon cats, kittlings, whelps, and ratts, without one drop of water."

Why is the Mews, at Charring Cross, so called?

Because it was originally the *mew*, which, in the falconer's language, signifies a place wherein the hawks were put at the moulting (or mewing) time, when they cast their feathers. The King's hawks were kept at this place as early as the year 1377, an. 1, Richard II, but in 1537, the 27th year of Henry VIII, it was converted into stables for that monarch's use, and the hawks were removed.

The word *mew* is also used metaphorically for any close place. Spenser has

> Forth coming from her darksome *mew*,
> Where she all day did hide her hated hew.
> *Fairy Queen.*

Hence also, to mew, or keep shut up:

> More pity that the eagle should be *mew'd*,
> While kites and buzzards prey at liberty.—*Richard* III.

Why was a seller of hawks called a cadger?

Because the round frame of wood on which they carried their birds formerly was called a *cadge*. *Cadger* is also given as meaning a huckster, from which the familiar term *codger* is more likely to be formed than from any foreign origin.—*Nares.*

Why is an itinerant dealer called a hawker?

Because, perhaps it originally signified one who carried about hawks for sale, though obsolete in that sense by the disuse of the thing—*Nares.*

Johnson derives it from *hoch*, a German word for a salesman.

Why do we use the proverb, between hawk and buzzard?

Because it originally meant between two dangerous enemies, a hawk and a kite. It is now chiefly used to express mere doubt. The hawk is teachable, the buzzard is not; whence the French put them together in a proverb:—"you cannot make a hawk of a buzzard."—*Nares.*

Why was the stalking-horse used in fowling?

Because it was originally a horse trained for the purpose, and covered with trappings, so as to conceal the sportsman from the game he intended to shoot at. It enabled the archer to approach the birds unseen by them, so near, that his arrows might easily reach them;

but as this method was frequently inconvenient, and often impracticable, the fowler had recourse to art, and caused a canvass figure to be stuffed, and painted like a horse grazing, but sufficiently light to be moved with one hand. These deceptions were made in the form of oxen, cows, stags, &c.

HORSE-RACING.

Why is it concluded that horse-racing was known and practised by the Anglo-Saxons?

Because, when Hugh, the head of the house of the Capets, afterwards monarchs of France, solicited the hand of Edelswitha, the sister of Athelstan, he sent to that prince, among other valuable presents, several *running horses*, with their saddles and their bridles, the latter embellished with bits of yellow gold.—*Strutt.*

Why were horses formerly run in West Smithfield?

Because they were usually exposed there for sale so early as the time of Henry II; when, to prove their good qualities, they were matched against each other. This is said to be the earliest record of horse-racing in England; and is thus described by Fitzstephen:—"When a race is to be run, (by valuable hackneys, and charging studs) and perhaps by others, which also in their kind are strong and fleet, a shout is immediately raised, and the common horses are ordered to withdraw. Three jockeys, or sometimes only two, as the match is made, prepare themselves for the contest. The horses, on their part, are not without emulation, they tremble, are impatient, and are continually in motion; at last, the signal once given, they strike, devour the course, hurrying along with unremitting velocity. The jockeys, inspired with the thoughts of applause, and the hopes of victory, clap spurs to their willing horses, brandish their whips, and cheer them with their cries."

Moryson, in his facete *Itinerary*, 1617, records a strange prejudice, which in some measure, exists to this day: "The Londiners pronounce wo to him that buyes a horse in Smithfield, that takes a servant in Paul's Church, that marrics a wife out of Westminster."

The grave John Locke, in one of his private journals, date 1679, (lately edited by Lord King,) says "The sports of England, which, perhaps a curious stranger would be glad to see, are horse-racing, hawking, and hunting; bowling,—at Marebone and Putney he may see several persons of quality, bowling two or three times a week all the summer; wrestling in Lincoln's Inn Fields every evening all the summer; bear and bull baiting, and sometimes prizes, at the Bear-garden; shooting in the long-bow and stob-ball, in Tothil Fields; cudgel-playing at several places in the country; and hurling, in Cornwall."

From the Life of the accomplished Lord Herbert of Cherbury, it would appear that horse-racing was a gambling sport even in his time; for, he says "I do not approve of the running of horses, there being much cheating in that kind of exercise; neither do I see why a brave man should delight in a creature, whose chief use is to help him run away:" although elsewhere he says, "a good rider on a good horse, is as much above himself and others, as this world can make him."

Why was Chester formerly celebrated for its races?

Because the earliest commencement of a regular horse race is traced in a Shrove-Tuesday custom at Chester, when the company of saddlers presented to the drapers a wooden ball garlanded with flowers, and placed upon the point of a lance; but in 1540, the ball was changed into a bell of silver, valued at 3s. 6d. or more, to be given to him who should run the best and the farthest on horseback. At length, an innkeeper and mayor of Chester first caused horses to be entered for this race, in 1624, the horses to run five times round the roody, and "he who won the last course or trayne, received *the bell*, of a good value, of eight or ten pounds or thereabout; which moneys were collected of the citizens, to a sum for that purpose."

Why were swift running-horses kept by the early sovereigns of England?

Because they were serviceable for heralds and messengers in cases of urgency; hunting also was among their uses, but we do not find that they were kept for racing only, as horses are in the present day.

Why were races formerly called bell-courses?

Because, as we have just shown, the prize was a silver bell. Hence, to win the race was to bear away the bell.*

Why is a race prize called the plate?

Because, about the close of the seventeenth century, the bells were converted into cups, or some other pieces of plate, usually valued at 100 guineas each; and upon these trophies of victory, the exploits and pedigree of the successful horses were most commonly engraved. James I. and the two Charleses, were patrons of horse-racing, and William III. established an academy for riding; and his queen not only continued the bounty of her predecessors, but added several plates to the former donations. George I, instead of a piece of plate, gave an hundred guineas to be paid in specie.—*Strutt.*

Their successors have been equally liberal, and King's and Queen's *plates* have accordingly accumulated; George the Fourth, in early life, an active patron of the turf, had a fine stud of racers, which has been much reduced by the less congenial taste of his successor, who will, however, continue the *plates* of his brother's liberality.

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* See Zoology—*The Horse*, Part 2, page 52, in the last line of which for bell, read *ball.*

Why, at Newmarket, are there at the winning-post and distance post, two men holding crimson flags?

Because, as soon as the first horse has passed the winning-post, the man may drop his flag; and the other at the distance-post may drop his at the same moment, and the horse which has not then passed that post is said to be *distanced*, and cannot start again for the same plate or prize. A *distance* is 240 yards from the winning-post.

Why is a feather-weight so called?

Because it is the lightest weight that can be put upon the back of a horse.

Why is a give-and-take plate so called?

Because the horses carry weight according to their height. Fourteen hands are taken as the standard height, and the horse must carry nine stone, the horseman's stone being 14lb. Seven pounds are taken from the weight for every inch below fourteen hands, and seven pounds added for every inch above fourteen hands. A few pounds additional weight is so serious an evil, that it is said, seven pounds in a mile-race are equivalent to a distance.

Why is a post-match so called?

Because the parties possess the privilege of bringing any horse of a certain age to the post.

Why is a produce match so called?

Because it is between the produce of certain mares in foal at the time of the match, and to be decided when they arrive at a specified age.

Why was the horse Eclipse so named?

Because he distanced all horses with whom he ran; or in other words, they had no place. Of his speed no correct estimate can be formed; for he never met with an opponent sufficiently fleet to put it to the test.

Eclipse produced 334 winners, and these netted to their owners more than one hundred and sixty thousand pounds; exclusive of plates and cups. This fine animal died in 1789, at the age of twenty-five years.

Childers, another famous race horse, moved eighty-two feet and a half, in a second of time; or, nearly *a mile a minute:* he ran round a course at Newmarket, (about four miles) in six minutes and forty seconds. Racers usually run the four-mile Newmarket course in about seven minutes and three-quarters, or eight minutes, or twenty-four feet at each stretch.

Why was the cheating game of pricking at the belt first introduced at races?

Because of its origin among gypsies, who frequent races in great numbers. Mr. Brand says, "it appears to have been a game much practised by the gypsies in the time of Shakspeare. For the information, if not for the benefit, of the unwary, its description is as follows: a leathern belt is made up into a number of intricate folds, and placed edgewise upon a table. One of the folds is made to resemble the middle of the girdle; so that whoever shall thrust a skewer into it, would think he held it fast to the table; whereas, when he has so done, the person with whom he plays, may take hold of both ends, and draw it away. The game is, however, often played with list, instead of a leathern belt, whence it is called pricking at *the garter;* and adepts in the game have been facetiously termed "knights of the garter." Mr. Brand also calls it "fast and loose."

Why were the Game-Laws first established?

Because of the oppressive rule of William the Conqueror; who not only seized on all the forests, but pretended an absolute right to them. Thus, he confined all hunting and fowling in them to himself, or such as he should permit or appoint. He punished, with the loss of his eyes, any that were convicted of killing the wild boar, the stag, or roe-buck. In the reigns of

William Rufus, and Henry I, it was less criminal to murder a man than to kill a beast of the chase.

ARCHERY.

Why is shooting with a bow and arrow called archery?

Because the bow, when drawn, is in the shape of an arch.

Why is it inferred, that the bow was the most ancient and most common of all weapons?

Because Ishmael, we are told, became a wanderer in the desert, and an archer: so were the heroes of Homer; and the warriors of every age and country have been acquainted with the use of similar arms.

Strutt has copied from a Saxon manuscript, representations of Esau, going to sell venison for his father; and Ishmaël, after his expulsion from the house of Abraham, and residing in the desert.

Why were the English formerly expert in archery?

Because, as far back as the thirteenth century, every person not having a greater annual revenue in land than one hundred pence, was compelled to have in his possession, a bow and arrow, &c.; and all such as had no possessions, but could afford to purchase arms, were commanded to have a bow with *sharp* arrows, if they dwelt without the royal forests, and a bow with *round-headed* arrows, if they resided within the forests, to prevent the owners from killing the king's deer.

His skill in the use of the long bow was the proud distinction of the English yeoman, and it was his boast that none but an Englishman could bend that powerful weapon. Chaucer describes his archer, as carrying "a mighty bow;" and the "cloth-yard shaft," which was discharged from this engine, is often mentioned by our old poets and chroniclers. The command of Richard III, at Bosworth, was this:

> "Draw, archers, draw your arrows to the head."

To the use of the bow as a warlike weapon, we need here refer but briefly. The bow, too, claims part of the glory of the conquest of England, by William, Duke of Normandy. The Norman army was fronted by "footmen clothed in light armour, worn over a gilted cassock, and bearing either long-bows, or steel cross-bows;" and the celebrated onset of Taillefer, gave note for the attack by showers of arrows, returned by tremendous cuts of steel axes. Harold, himself, too, had his eye struck by an arrow; notwithstanding which, he continued to fight at the head of his army. The bowmen were also the chief reliance of the English leaders in our bloody battles, for the succession to the Crown of France. At Agincourt, Cressy, Poitiers, and Flodden, it did terrific execution; and many of its effects are graphically described in the sparkling pages of Froissart.

Why were the English archers so superior to those of other countries?

Because it seems there was a peculiar art in the English use of the long-bow; for our archers did not employ all their muscular strength in drawing the string with the right hand, but thrust the whole weight of the body into the horns of the bow with the left.

Why was archery first practised as a holyday pastime?

Because of a command of Edward III, that the leisure time upon holydays should be spent in recreations with bows and arrows. Richard II, and Edward IV. made similar ordinances: the latter, that "every Englishman, and Irishman dwelling in England, should have a long-bow of his own height, that butts should be set up at every township, at which the inhabitants were to shoot upon all feast days," or be fined one halfpenny for each omission. In the 16th century the use of the long-bow was much neglected. Henry VIII. however, made laws in favour of archery; instituted a chartered society for shooting, and with waggish humour dignified a successful archer, named Barlow, by saluting him as Duke of Shoreditch, at which place the man resided. This dignity was long preserved by the captain of the London archers, who used to summon the officers of his several divisions by the titles of the Marquises of Barlow, Clerkenwell, Islington, Hoxton, Earl of Pancras,&c. Stow informs us, that before his time, (he died 1605) it was customary for the lord mayor, sheriffs, and aldermen, to go into Finsbury Fields, where the citizens were assembled, and shoot at the standard with broad and flight arrows for games. After the reign of Charles I. archery fell into disrepute. Sir William Davenant satirizes the attorneys and proctors shooting in Finsbury Fields. The Artillery Company, or Finsbury archers, revived in 1610, retaining the use of the bow, as well as their place of exercise. About 1753, a society of archers erected targets in Finsbury fields during Easter and Whitsuntide, when the best shooter was styled captain for the ensuing year, and the second lieutenant. About 1789, archery was again revived as a general amusement; and societies of bow-men, or toxophilites, were formed in almost every part of the kingdom. Moreley, in his Essay on Archery, 1792, enumerates twenty of the principal societies then existing. In the present century archery has been occasionally revived, more as a private than a public amusement. About five years since there were companies in the neighbourhood of Taunton: at Harlow, in Essex; Bury, in Suffolk; and at Westminster; and about a month since a society was formed at Newbury in Berkshire.

Archery, as a branch of school amusements, existed at Harrow within the last sixty years. In the original regulations for the endowment of the school, date 1590, the benevolent founder specifies the only amusements allowed at Harrow:—"Driving a top, tossing a handball, running, and *shooting*." For this latter exercise all parents were required to furnish their children "with bowstrings, shafts, and breasters." In consequence of this regulation it was usual to hold an annual exhibition of archery, on August 4, when the scholars contended for a silver arrow. Of this sport we have seen an etching, now become somewhat scarce. This custom has been abolished, and in its room has been substituted the delivery of annual orations before the assembled governors.

Why are the heroes of romance usually praised for their skill in archery?

Because, in the early ages of chivalry, the usage of the bow was considered as an essential part of the education of a young man who wished to make a figure in life.—*Strutt.*

Why was the long-bow so called?

Because it might be distinguished from the arbalist or cross-bow, which was not only much shorter than the former, but fastened also upon a stock, and discharged by means of a catch or trigger, which probably gave rise to the lock on the modern musket.—*Strutt.*

Bayle, explaining the difference between testimony and argument, uses this laconic simile. "Testimony is like the shot of a long-bow, which owes its efficacy to the force of the shooter; argument is like the shot of the cross-bow, equally forcible, whether discharged by a dwarf or a giant."

Why was the arbalist, or cross-bow, also called a steel-bow?

Because the horns were usually made with steel.

Why were cross-bows also called stone-bows?

Because they were modified to the purpose of discharging of stones.

Why were cross-bows much less common than long-bows?

Because of several laws for the prohibition of the former. In the time of Henry VIII. a penalty of ten pounds was inflicted on every one who kept a cross-bow in his house.

Why was a certain arrow called a bolt?

Because it had a round or half round bolt at the end of it, with a sharp-pointed arrow head proceeding therefrom. When it had only the blunt bolt, without the point, it was a *bird bolt.* Hence the phrase, *bolt upright,* and the sign of the *bolt*-in-tun, (or tub,) in Fleet-street, London. The bolt thus differed from a shaft, which was sharp or barbed. Hence the proverb, "to make a *bolt*, or a *shaft* of a thing." We have the first also in the proverb, "A fool's *bolt* is soon shot." Nares says, "See also *Midsummer Night's Dream*, ii. 2, for the exquisite beauty of the passage." Here it is, from one of the most splendid pages of Shakspeare:

(*Oberon to Puck.*) I saw (but thou couldst not)
Flying between the cold moon and the earth,
Cupid all arm'd; a certain aim he took,
At a fair vestal, throned by the west;
And loos'd his love-shaft smartly from his bow,
As it should pierce a hundred thousand hearts:
But I might see young Cupid's fiery shaft
Quench'd in the chaste beams of the wat'ry moon;
And the imperial vot'ress passed on,
In maiden meditation, fancy free.
Yet mark'd I where the bolt of Cupid fell;
It fell upon a little western flower,
Before milk-white; now purple with love's wound—
And maidens call it, love-in-idleness.
Fetch me that flower; the herb I show'd thee once;
The juice of it on sleeping eyelids laid,
Will make or man or woman madly dote
Upon the next live creature that it sees.

Why was the word "aim" formerly used for applause or encouragement?

Because, to cry *aim*, in archery, was to encourage the archers by crying out *aim*, when they were about to shoot.

Why was to "give aim," an office of direction and assistance?

Because the person chosen stood within a convenient distance of the butts, to inform the archers how near their arrows fell to the mark; whether on one side or the other, beyond or short of it. The terms were, *wide* on the *bow* hand, or the *shaft* hand, i. e. left and right; *short*, or *gone*, the distance being estimated by bows' lengths. This was, in some measure, a confidential office, but was not always practised.—*Nares.*

Maria gives aim in *Love's Labour Lost*, when she says,—

> *Wide* o'er the *bow-hand!* I' faith your hand is out.

So Venus assists Cupid:

> While lovely Venus stands *to give the aim*,
> Smiling to see her wanton bantling's game.—
> *Drayton's Eclogues*, 1420.

Why was "too much o' the bow-hand" used to denote a failure in any design?

Because the bow-hand is the left hand, in which the bow was held.

Why was a certain arrow called a butt-shaft?

Because it was used for shooting at butts; formed without a barb, so as to stick into the butts, and yet be easily extracted.—*Nares.*

> The very pin of his heart cleft with the blind bow boy's but-shaft.
> *Romeo and Juliet.*

Why was an archer said to hit the white?

Because the centre part of the mark upon the butts was *white*. The whole was painted in concentric circles of different colours, the interior circle being white; and in the centre of the white was a pin of wood, to cleave which with the arrow was the greatest triumph of a marksman. Hence, *to hit the white*, was used to signify, "to be right," "you have hit the mark;" expressions common in old authors, as shooting was in their time a daily practice.

Why was the yew preferred for bows?

Because of the compactness, hardness, and elasticity of the wood; and so much of it was required for the above purpose, that ships trading to Venice were obliged to bring ten bow-staves along with every butt of malmsey.

Why were young archers recommended to shoot in the dark, at lights set up for that purpose?

Because one great fault which they generally fell into, was the direction of the eye to the end of the arrow, rather than to the mark.

Why was it necessary for an archer to have several arrows of one flight, plumed with feathers from different wings?

Because they might suit the diversity of winds.—*Strutt.*

Why is the term "upshot" so commonly used?

Because, in archery, it formerly signified the decision, and, though archery is now so much in disuse, the above word, in the sense of the end or conclusion of any business, is still retained.

Why was the bow, even in Elizabeth's time, thought to be more advantageous than the musket?

Because the latter was at the period very cumbrous, and unskilful in contrivance, while archery had been carried to the highest perfection. Mr. Grose tells us, that an archer could formerly shoot six arrows in the time necessary to charge and discharge a musket, and even in modern days a practised bowman has been known to shoot twelve arrows in a minute, into a circle not larger than the circumference of a man's hat, at the distance of forty yards.

QUOITS AND DUMB-BELLS.

Why was throwing of heavy weights and stones with the hand much practised in former times?

Because, as this pastime required great strength and muscular exertion, it was a very proper exercise for military men. Casting of the bar is frequently mentioned by the romance writers as one part of a hero's education, and a poet of the sixteenth century thinks it highly commendable for kings and princes, by way of exercise, to throw "the stone, the barre, or the plummet." Henry the Eighth, after his accession to the throne, according to Hall and Holinshed, retained "the casting of the barre" among his favourite amusements. The sledge-hammer was also used for the same purpose as the bar and the stone; and, among the rustics, if Barclay be correct, the axle-tree. —*Strutt.*

Why is the discus of the ancients, improperly called, in England, quoit?

Because the game of quoits is a game of skill; whereas the discus was only a trial of strength, as among us to throw the hammer.

In Homer's Iliad, (Pope's translation) book xxiii. we find the following:

> Then hurl'd the hero, thundering on the ground
> A mass of *iron*, (an enormous round)
> Whose weight and size the circling Greeks admire,
> Rude from the furnace, and but shap'd by fire.
> Let him whose might can hurl this bowl, arise,
> Who further hurls it, takes it as a prize.

Hence it has been erroneously inferred that the Greeks were acquainted with quoits. The *discus* appears to have been a round flat plate of metal, of considerable magnitude, and very heavy. The *quoit* is of iron also, and perforated in the middle: the latter game may therefore have been derived from the Greeks, but the actual identity of the discus and the quoit cannot be established.

Why is the quoit, in many places, called a shoe?

Because formerly, in the country, the rustics not having the round perforated quoits to play with, used horse-shoes.

Why is ringing of the dumb-bells of considerable antiquity?

Because we find an author of the sixteenth century advising young men, by way of amusement, to "labour with poises of lead or other metal," which form the modern "bells." Strutt observes, "this notable pastime, I apprehend, bore some resemblance to the Skiomachia, or fighting with a man's own shadow, mentioned in the *Spectator*, No. 115. 'It consisted,' says the author, 'in brandishing of two sticks grasped in each hand, and loaden with plugs of lead at either end;—this pastime opens the chest, exercises the limbs, and gives a man all the pleasure of boxing without the blows.'"

RUNNING.

Why was foot-racing originally a more honourable pastime than at present?

Because in the middle ages it was an essential part of a young man's education, especially if he was the son of a man of rank, and brought up to a military profession; whereas, in the present day, foot races seldom happen but for the purpose of betting.

Why is the game prison, bars, or base, believed to be of great antiquity?

Because of its mention in the proclamations of Edward III, where it is spoken of as a childish amusement, and prohibited to be played in the avenues of the palace at Westminster, during the sessions of parliament, from its interruption of the members, and others, in passing to and fro. It is also spoken of by Shakspeare as a game practised by the boys:

> He, with two striplings, lads more like to run
> The country base, than to commit such slaughter,
> Made good the passage.—*Cymbeline.*

The lines following give some idea of the sport:

> So ran they all as they had been at base,
> They being chased that did others chase.
>
> *Spenser.*

This game was also played by men, especially in Cheshire, and the adjoining counties. About 1780, a grand match at base was played in the fields behind Montague House, (now the British Museum) by twelve gentlemen of Cheshire against twelve of Derbyshire, for a considerable sum of money. We need not describe this pastime. Strutt says, "In Essex they play it with the addition of *two prisons*;" and we can add similar testimony of two prisons in the game, as played in Hertfordshire, where it was a favourite recreation of our "careless childhood."

Why was Barley-break also called "Last in Hell"?

Because it was played by six people, (three of each sex) who were coupled by lot. A piece of ground was then chosen, and divided into three compartments, of which the middle one was called *hell*. It was the object of the couple condemned to this division to catch the others, who advanced from the two extremities; in which case a change of situation took place, and hell was filled by the couples who were excluded by pre-occupation from the other places; in this *catching*, however, there was some difficulty; as, by the regulations of the game, the middle couple were not to separate before they had succeeded, while the others might break hands whenever they found themselves hard pressed. When all had been taken in twice, the last couple were said to be in *hell*, and the game ended. —*Mr. Gifford, from a passage in Sir Philip Sidney's Arcadia.*

The couples being paired, a male and female together, it seems they sometimes solaced themselves in their confinement by kisses, as appears from this epigram:

We two are last in hell: what may we fear
To be tormented or kept pris'ners here?
Alas! if kissing be of plagues the worst,
We wish in hell we had been last and first.
Herrick's Hesperides.

The Scottish barley-break differs from ours. Archdeacon Nares thinks our puerile game of *tag* to have been derived from the above; for there was a *tig* or *tag* in the game as played in Yorkshire, where a touch made prisoners.

SKATING.

Why is skating so called?

Because of its origin from the German *skait* or *skate*, to glide along a smooth surface.

Skating was undoubtedly introduced among us from Holland; but a kind of rude essay towards it was made among ourselves very early, by tying bones upon the feet. Fitzstephen, who wrote in the reign of Henry II, tells us, that "when the great pane or moor (which watereth the walls of the citie on the north side) is frozen, many young men play upon the ice; some stryding as wide as they may, doe slide swiftly; some *tie bones to their feete, and under their heeles*, and shoving themselves by a little picked staffe, doe slide as swiftly as a birde flyeth in the air, or arrow out of a crosse-bow." He describes also contests on the ice between such skaters. Strutt acknowledges that he cannot trace the first introduction of this pastime into England.

Fitzstephen likewise describes another pastime on the ice:—"Others make a seat of ice, as large as a millstone, and having placed one of their companions upon it, they draw him along," &c. This contrivance was superseded by sledges, common upon the Thames in the hard frosts of the last century, as appears in the following couplet from a song upon the great frost of 1716:

> "While the rabble in sledges run giddily round,
> And nought but a circle of folly is found."

The Dutch are allowed to be the first skaters in Europe.*

Few modern feats upon the ice exceed the following, narrated in the *Quarterly Review*, No. 73:—"We remember, many years ago, two Englishmen fixing iron runners to a Russian sledge; with which, after rigging it with mast and sail, they started upon the Neva, and darted along at the rate of twenty-two miles an hour. Having, in their progress, observed a wolf crossing on the ice, they steered directly towards it; and such was the velocity of the sledge, that it cut the animal in two. They had no doubt that, with a double quantity of canvass, they could have nearly doubled the velocity."

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* We have a free pen-and-ink drawing of the frozen Scheldt, with hundreds of male and female skaters. In the centre of the picture is a lady of consequence, seated in a sledge, the body of which is of a carlike shape, with the fore-part of a pawing horse in front. The sledge is drawn by one horse, driven by a man who is placed behind the seat or body of the vehicle.

WRESTLING.

Why have the inhabitants of Cornwall and Devon been so long celebrated for their expertness in wrestling?

Because they learned the art at an early period of life, "for you shall hardly find," says Carew, "an assembly of boys in Devon and Cornwall, where the most untowardly among them will not as readily give you a muster (trial) of this exercise as you are prone to require it."—*Survey of Cornwall.* Hence, to give a *Cornish hug*, is a proverbial expression. The Cornish, says Fuller, are masters of wrestling, so that if the Olympian games were now in fashion, they would come away with the victory.

Their *hug* is a cunning close with their fellow combatants, the fruits whereof is his fair fall or foil at the least.—*Worthies of Cornwall.*

We learn from Stow that the citizens of London formerly wrestled on St. Bartholomew's day before the lord mayor and aldermen, who rode out of town on horseback to witness the sport. The Londoners and inhabitants of Westminster also made frequent matches, the reward being usually a ram. Thus Chaucer says of Sir Mopas,

> Of wrastling there was none his pere,
> Where any ram shulde stonde.

Before Chaucer's time, however, a cock seems to have been a frequent prize.

BOAT-ROWING.

Why has boat-rowing always been practised among the upper classes of society?

Because, like the sports already enumerated, it formerly was part of the education of a gentleman. The Saxons thought it by no means derogatory for a nobleman of the highest rank to row or steer a boat with dexterity and judgment. The reader will recollect the popular story of Edgar being rowed on the river Dee by eight kings, while himself, the 9th, sat at the stern of the barge, and held the helm.

Why were rowing matches first introduced into this country?

Because of the discontinuance of tilting at the quintain, and justing one against another in boats; since, the pastime, though frequently practised among the Greeks and Romans, does not seem to have been previously attended to in England.

Why were the theatres, which formerly stood on the banks of the Thames, so beneficial to the watermen?

Because it was then the fashion to go to the theatre *by water*. Taylor, the water poet, tells us, that about the year 1596, 40,000 watermen were thus maintained. The *Globe*, the *Rose*, and the *Swan* theatres were on Bankside; besides which, there were also six other theatres on the Middlesex bank of the Thames. Sir Roger de Coverley's journey to Vauxhall Gardens, by the Thames, was probably the last relic of this aquatic fashion.

TENNIS, FIVES, &c.

Why were tennis-courts common in England in the sixteenth century?

Because tennis play was then taken up by the nobility, and in the covered courts it might be practised without any interruption from the weather. Henry VII. was a tennis-player; in the expenditure of his reign is an entry:—" Item, for the king's loss at tennis, twelve-pence," &c. Henry VIII, according to Stow, added "divers fair tennis-courts" to Whitehall. James I. speaks of tennis as a princely game. Charles II. had particular dresses in which he played.

Why is hand-tennis called fives?

Because it was originally played by *five* competitors on either side, as the succeeding passage would seem to indicate:—" When Queen Elizabeth was entertained at Elvetham, Hampshire, by the Earl of Hertford, after dinner, about three o'clock, ten of his lordship's servants, all Somersetshire men, in a square greene court before her Majestie's windowe, did hang up lines, squaring out the forme of a tennis-court, and making a cross line in the middle; in this square they played *five to five* with hand-ball, at bord and cord, as they tearme it, to the great liking of her highness."—*Nichols's Prog. Queen Eliz.*

Why is cricket supposed to be a modern game, and to have originated from the club ball, which nearly resembles goff?

Because, according to Strutt, the appellation cannot be traced beyond the commencement of the last century, where it occurs in one of D'Urfey's songs:

Her was the prettiest fellow,
At foot-ball or at cricket;
At hunting race or nimble race,
How featly her could prick it.

Why is trap-ball supposed to be coeval with most of the early games played with the bat and ball?

Because it can be traced as far back as the fourteenth century. As it was then played, the trap was sufficiently elevated to raise the ball to strike at, without stooping.

Strutt tells us, that boys and the common herd of rustics who cannot procure a trap, content themselves with making a round hole in the ground, and by way of lever use the brisket bone of an ox, or a flat piece of wood of like size and shape, which is placed in a slanting position, one half in the hole with the bat upon it, and the other half out of it; the elevated end being struck smartly with the bludgeon, occasions the ball to rise to a considerable height, and all the purposes of a trap are thus answered, especially if the ground be hard and dry.

Why is the game "head or tail" *of considerable antiquity?*

Because it is the same as *cross and pile*, played by Edward II. as appears by one of his wardrobe rolls. Anciently the English coins were stamped with a cross on one side. The origin of this game is farther traced to the Greeks, who played it with a shell smeared with pitch on one side, and thus making white and black.

CHIVALRIC SPORTS.

Why did a tournament differ from a just?

Because the tournament was a conflict with many knights, divided into parties, and engaged at the same time; whereas the just was a trial of skill, when only one man was opposed to another. Again, Mr. Mills says, "the just was a martial exercise; but the tournament was connected with all the circumstances of domestic life."

Why were tournaments and justs held in the highest esteem?

Because they were prohibited to all below the rank of an esquire.

Why was the tournament so called?

Because it was the practice of the knights to run *par tour*, that is, by turns, at the quintain, and wheeling about successively in a circle to repeat their course; but in process of time they improved upon this pastime, and ran at one another, which certainly bore a much greater similitude to a real engagement.—*Fouchet.*

Why was the just so called?

Because of its origin from the Latin, *justa*, and French *jouste*, which some derive from *jocare*, because it was a sort of sportive combat, undertaken for pastime only, and secondary or inferior to the tournament.

Why were tournaments so frequently held in the middle ages?

Because the martial spirit of the people was nourished by such customs, for kings were always eager to hold tournyes for the better training up of soldiers to feats of arms. Fame, fortune, and woman's love, were the dazzling rewards of these exercises. Thus, Holinshed, speaking of one of them held in Smithfield, in 1389, says, "And so many a noble course and other martial feats were achieved in those four days, to the great contemplation and pleasure of many a young bachelor desirous to win fame." The objects and tendencies of tournaments are likewise extremely well expressed by Jeffery of Monmouth:—"Many knights famous for their feats were present, with apparel and arms of the same colour and fashion. They formed a species of diversion, in imitation of a fight on horseback; and the ladies being placed on the walls of the castles, darted amorous glances on the combatants. None of these ladies esteemed any knight worthy of her love but such as had given proof of his gallantry in three several encounters. Thus, the valour of the men encouraged chastity in the women, and the attention of the women proved an incentive to the soldier's bravery." It was the general result of tournaments for a vanquished knight to forfeit his armour and horse to his victor.

Why was the knight who fell from his horse, more dishonoured than he who was disarmed?

Because good horsemanship was the first quality of a knight. Hence it was thought less dishonourable for a tourneying cavalier to fall with his horse, than to fall alone. He who carried his lance comelily and firmly was more worthy of praise, although he broke not, than he who misgoverned his horse and broke.—*Mills's History of Chivalry.*

Why were pointed weapons forbidden at tournaments?

Because national rivalry, and envy of martial prowess, or of woman's love, often converted tournaments into real battles. This also occasioned an oath to be imposed on all knights, that they would frequent tournaments solely to learn military exercises.

Why is the ribbon, often drawn from a maiden's bosom, and sent off to reanimate her chosen knight, conjectured to have been blue?

Because that colour was the emblem of constancy: thus, Chaucer, in his *Court of Love*:—

> Lo, yonder folk, quoth she, that kneel in blue,
> They wear the colour, aye, and ever shall,
> In sign they were, and ever will be true,
> Withouten change.

Why did not heralds, at justs and battles, cry out "Honour to the brave," instead of "Honour to the sons of the brave?"

Because no knight could be deemed perfect, until death had removed the possibility of his committing an offence against his knighthood, and thus effacing the merit of all his former deeds.—*Monstrelet.*

Why was it dishonourable to break a lance traverse, or across the breast of an opponent, without striking him with the point?

Because, as it could only occur from the horse swerving on one side, it showed unskilful riding.

To "break across," the phrase for bad chivalry, did not die with the lance. It was used by the writers of the Elizabethan age to express any failure of wit or argument. Thus, Celia, in *As you like it*, says of Orlando tauntingly, "O that's a brave man. He writes brave verses, speaks brave words, swears brave oaths, and breaks them bravely, quite traverse, athwart the heart of his lover, as a puny tilter, that spurs his horse but on one side, breaks his staff like a noble goose."

Why were justs often called round tables?

Because, in early time in England, the tournament festivals were held about a round table. Again, a fraternity of knights, who frequently justed with each other, and accustomed themselves to eat together in one apartment, in order to set aside all distinction of rank or quality, seated themselves at a *circular* table, because every place there was equally honourable. Our historians attribute the institution of the round table to Arthur, the son of Uter Pendragon, a celebrated British hero, whose achievements are so disguised with legendary wonders, that it has been doubted if such a person ever existed in reality. In the reign of Edward I, Roger de Mortimer established a round table at Kenilworth, and entertained at his expense 100 knights, and as many ladies. Edward III. next endeavoured to realize the golden imaginations of fable, which had assigned 150 as the complement of Arthur's chivalry, by establishing at Windsor, in 1334, a round table 600 feet in circumference, the weekly expense of maintaining which was one hundred pounds. Philip de Valois, of France, next established a rival table, after which we hear no more concerning the ceremony. The festivals were succeeded by a ball, the knights, in the dance, taking precedence agreeably to their feats of arms in the morning. By the way, the *round-robin* (a circular list in which neither name is first) must have originated in the round table of chivalric times.

In England the round table was succeeded by the order of the Garter, the ceremonial parts of which are retained to this day. See Part III. of the present work, *p.* 19.

Why were the guests at festivals placed two by two, and only one plate allotted to each pair?

Because to eat on the same trencher or plate with any one, was considered the strongest mark of friendship and love.—*Mills.*

Why was the quintain one of the most favourite exercises of chivalry?

Because it was particularly calculated to practise the eye and hand in giving a right direction to the lance. A half figure of a man, armed with sword and buckler, was placed on a post, and turned on a pivot, so that if the assailant with his lance hit him not on the middle of the breast, but on the extremities, he made the figure turn round, and strike him an ill-timed blow, much to the merriment of the spectators. The game of quintain was sometimes played by hanging a shield on a staff fixed in the ground, and the skilful squire riding apace struck the shield in such a manner as to detach it from its ligatures.—*Du Cange and Menage.*

Nares believes it was more commonly, in England at least, constructed in the simpler way, as thus described in an old novel: "a quinten is a cross bar turning upon a pole, having a broad board at one end, and a bag full of sand at the other. Now, he that ran at it with his lance, if he hit not the board, (which was probably often painted like a figure,) was laughed at to scorn; and if he hit it full, and rid not the faster, he would have such a blow with the sand-bag on his back, as would sometimes beat him off his horse." *The Essex Champion,* (*about*) 1690. Fitzstephen also describes the water quintain usually practised on the Thames during the Easter holydays.

The most recent revival of this ancient game was at a grand fête given by Lord Gage, at Firle Place, Sussex, August 3, 1827.

Why is the game of quintain so called?

Because it was invented by Quinetus or Quintas, "but who he was, or when he lived," says Strutt, "is not ascertained. The game itself was a species of mock combat among the Romans, who caused the young military men to practise at it twice a day. From the Romans it descended to the Welch, who spell it *gwyntyn*, literally meaning *vane*. It was a bridal game: thus Ben Jonson says,

> At quintin he,
> In honour of his bridal-tee,
> Hath challenged either wide countee.

Dr. Kennet, in his *Parochial Antiquities*, from Dr. Plot, says, that at the village of Blackthorn, through which the Roman road lay, they use it at their weddings to this day, on the common green, with much solemnity and mirth." Dr. Plot also says, "it was set up in the way for young men to ride at, as they carry home the bride; he that breaks the board being counted the best man."

Why was cutting off a lock of hair one of the preparations for knighthood?

Because to part with hair was always regarded in the church as a symbol of servitude to God.—*Du Cange.*

To this early custom may we not trace the affectionate interchange of a lock of hair among lovers?

Why was tilting, or running at the ring so called?

Because it was to ride at full speed, and thrust the point of the lance through the ring, which was supported in a case or sheath, by two springs, that might be readily drawn out by the force of the stroke, and remain upon the top of the lance. Commeniers, (date 1658) says, "at this day tilting at the quintain is used, when a hoop or ring is struck with a lance;" hence, it is clear that the ring was put in the place of the quintain.—*Strutt.*

We remember seeing at one of the fêtes at St. Cloud, near Paris, a game similar to the above; the players being seated on wooden horses on a large circular frame turning on a pivot, and resembling an English *round-about;* each player had a foil, with which he strove to seize the greatest number of rings from off a projecting but fixed wire.

Why is Smithfield so called?

Because of its corruption from Smethfield, as it were Smoothfield, "plain, (or smooth,) both in name and situation." Here were formerly held many justs and tournaments.

Why were the tournaments in the days of Henry VIII. more splendid than those of any previous period?

Because they were no longer simple representations of chivalry, but superb pageants were united to them. But Henry VIII. observes Mills, had none of the virtues of a true knight, and his conduct to his wives was anything but chivalric. Warton pleasantly observes, that had Henry never murdered his wives, his politeness to the fair sex would remain unimpeached.

Why was the space between Guisnes and Ardres, near Calais, called the Field of the Cloth of Gold?

Because of the splendid tournament held there between Henry VIII. and Francis I. and the immense quantity of *cloth of gold* consumed in making pavilions, &c.

Why is it erroneous to attribute the discontinuance of tournaments to the increased civilisation of the age?

Because tournaments increased in number as the world became more civilized. There were more tournaments in the fourteenth than in the thirteenth century, and even so late as the reign of Henry VIII. the whole of England seems to have been parcelled out into tilting-grounds.—*Note to Mills's Hist. Chivalry.*

Why were the young nobility of England soon perfect in chivalric exercises?

Because boys were sent to school to learn to read at four years of age. At six they were taught languages and the first principles of manners: from ten to twelve dancing and music were added to their accomplishments, and politeness was particularly encouraged. At fourteen they were initiated into the sports of the field, which prepared them for the ruder exercise of arms. At sixteen they were taught to just, to fight at the barriers, to manage the war-horse, to assail castles, to support the weight of armour; and to contend in feats of arms with their companions. And here their education terminated.—*From a passage in Hardynge's Chronicle.*

THEATRICAL PERFORMANCES.

Why were the actors of Greece and Rome called servants of Bacchus?

Because the dithyrambics, or songs in honour of Bacchus, first gave rise to the pomp and illusions of the theatre. At Athens are still seen the remains of the Temple of Bacchus, which was the first theatre in the world, and a masterpiece of architecture.

Why are actors sometimes termed Thespians?

Because one of the earliest was named Thespis, who, in a wagon at Athens, first acted tragedy, 535 years before Christ. In his time tragedy was carried on by a set of musicians and dancers, who introduced an actor between every two songs. The actors' discourse was called the Episode, and, being successful, Æschylus introduced two actors, and Sophocles added a third, which brought tragedy into its full perfection.

The first comedy was also acted at Athens, on a scaffold, by Saffarian and Dolon, 562 years before Christ. Thus, comedy being of earlier origin than tragedy, it is more proper to say comedy and tragedy, than tragedy and comedy.

Dryden has some fine lines on this subject:

> At first, the tragedy was void of art;
> A song, where each man danc'd and sung his part,
> And of god Bacchus roaring out the praise,
> Sought a good vintage for their jolly days:

Then wine and joy were seen in each man's eyes,
And a fat goat was the best singer's prize.
Thespis, at first, when all besmear'd with lee,
Began this pleasure for posterity;
And with his carted actors and a song,
Amus'd the people as he pass'd along.
Next *Æschylus* the different persons plac'd,
And with a better mask his players grac'd;
Upon a theatre his verse express'd,
And show'd his hero with a buskin dress'd.
Then *Sophocles*, the genius of his age,
Increas'd the pomp and beauty of the stage,
Engag'd the chorus song in ev'ry part,
And polish'd rugged vice by rules of art.

In mythology, Comedy is represented leaning on a column, holding a mask in her right hand, by which she is distinguished from her sisters, as also by a shepherd's crook. Her dress appears shorter, and not so ornamented as that of the other Muses. Melpomene, the presiding muse of tragedy, is generally represented as a young woman with a serious countenance. Her garments are splendid; she wears a buskin, and holds a dagger in one hand, and in the other a sceptre and crown.

Why were the Athenian theatres built without a roof?

Because roofs would have obstructed the free communication of the air; and in their theatres the Greeks considered not only the manners of the people, but also their health.

In these theatres the spectators were, of course, exposed to the weather; but, as at Athens the plays were always represented in the day time, the inconvenience was less. The Athenians came usually with great cloaks, to secure them from the rain or the cold; and for defence against the sun, they had the *sciadion*, a kind of parasol; but when a sudden squall arose, the play was interrupted, and the spectators dispersed.

Why were the ancient English plays called miracles?

Because they consisted of sacred plays, or representations of miracles wrought by the holy confessors, and the sufferings of the martyrs.—*Fitzstephen.*

Why were these dramatic pieces in later times called mysteries?

Because, as Dr. Percy supposes, the most mysterious subjects of Scripture were frequently chosen for their composition.

Why were the pieces which succeeded mysteries called moralities?

Because they were allegories, in which the characters personified certain virtues and vices. A curious copy of one of these moralities has been preserved, the first leaf of which contains the colour of the dresses, &c.

Why were inns formerly built with galleries or corridors round their court-yards?

Because, when miracles, mysteries, and moralities gave way to regular dramatic entertainments, the latter were of course not allowed to be performed in churches; hence they were represented in the yards of inns, in which, in the beginning of Queen Elizabeth's reign, the comedians erected an occasional stage. The spectators viewed the performances from these galleries or corridors.

Many inns so built may yet be seen in the city of London and the Borough; and some slight remains of them exist at Cambridge, where, in one inn-yard, there are remains, on one side, of two tiers of railed galleries, of one tier at the opposite side, and one tier at the end; the stage, it is presumed, was on the fourth side.

Why was the pit of our theatres originally called the cockpit?

Because cockfighting was its original appropriation:

Let but Beatrice
And Benedict be seen: Lo! in a trice,
The cockpit, galleries, boxes, all are full.——*Old Play.*

Shakspeare thus mentions the Globe Theatre at Bankside, in the play of Henry V:

Can this vast cockpit hold
The field of vasty France? or can we cram
Into this *wooden* O, the very casques
That did affright the air at Agincourt.

Another of our old theatres, the Phœnix, in Drury-lane, was also called the Cockpit, and the name is preserved to this day in Cockpit alley, opposite the present Drury Lane Theatre.

Why were clowns and fools first introduced on the stage?

Because of their origin from *devil* in the mystery, whose province it was to make the spectators merry, and to relieve the serious cast of the discourses. Thence it descended to *vice* or *iniquity* of the morality, who usually personified some bad quality incident to human nature, as pride, or lust, or any other evil propensity; and clowns and fools in regular tragedies and comedies are the descendants of this facetious iniquity. The great master of human nature, in compliance with the false taste of the age in which he lived, has admitted this motley character into the most serious part of one of his best tragedies.—*Strutt.*

Nares says, "Where Justice Overdo personates as fool, in the play of Bartholomew Fair, in order to spy out the proceedings of the place, he says, he wishes to be taken for 'something between a fool and a madman.' This is literally the character; a fellow who, pretending folly, has still the audacity of a madman." The dress is alluded to here:

————— Or, to see a fellow
In a long motley cloak guarded with yellow.
Prologue to King Henry VIII.

And by Jacques, in *As you like it*, when he repeats that "motley 's the only wear," &c.

The fool was usually a part of great license and facility to the actor, who was allowed almost to fabricate his own part. See Hamlet's directions to restrain this abuse. The fool was always to be merry:

I hold the world but as the world, Gratiano,
A stage, where every one must play his part,
And mine a sad one.
Gra. Let me play the fool:
With mirth and laughter, let old wrinkles come.
Merchant of Venice.

Hence, the phrase of playing the fool seems to have arisen.

Why is a conceited person called a coxcomb?

Because of his resemblance to the fool in the early drama, who was dressed in motley clothes, and wore a cap, surmounted with the neck and head of a cock, or sometimes only the crest, or *comb.*

Why is a merry-andrew so called?

Because of its origin among the Druids, *an Drieu*, i. e. Arch-Druid; or, from the celebrated Andrew Borde, the writer and empiric.

Why were certain fools called Court Fools?

Because they continued an appurtenance to the English court to a very late period. The accounts (says Mr. Douce) of the household expenses of our sovereigns, contain many payments and rewards to fools, both foreign and native, the motives for which do not appear, but perhaps might have been some witty speech or comic action that had pleased the donors. Dr. Fuller says, that the court jester "is an office which none but he that hath wit can perform, and none but he that wants it will perform." Muckle John, the fool of Charles I. and the successor of Archee Amstrong, is perhaps the last regular personage of the kind. The practice was not, however, abolished; for we have an epitaph written by Dean Swift, on Dicky Pearce, the Earl of Suffolk's fool, who was buried in Berkley churchyard, June 18, 1728. This person was an idiot. Lord Chancellor Talbot kept a Welsh jester, named Rees Pengelding. Another Welshman, called Will the Taborer, was retained in a similar capacity, about the beginning of the last century, by Sir Edward Stradling, of St. Donat's Castle, Glamorganshire. Lord Bussy Mansel, of Margam, had likewise in his service one Robin Rush, an idiot by nature, but who often said very witty things. There were people not long since alive in Wales, who well remembered him.

The Lord Mayor's Fool was a distinguished character of this class; and there was a curious feat which he was bound by his office to perform, in celebration of Lord Mayor's Day. He was to leap, clothes and all, into a large bowl of custard. This is alluded to here:

> He may, perchance, in tail of a sheriff's dinner,
> Skip with a rime o' the table, from new nothing,
> And take his almain leap into a custard,
> Shall make my lady mayoress and her sisters
> Laugh all their hoods over their shoulders.—*Ben Jonson.*

Although the City kept their fool, he did not improve their corporate wisdom; for they have been the sport of satire ever since the time of Charles II.

Why were certain actors first "Her Majesty's Servants"?

Because, at the time that it was customary for persons of rank to have private companies of actors, Queen Elizabeth, at the request of Sir Francis Walsingham, established, on handsome salaries, twelve of the principal players, under the name of "*Her Majesty's comedians and servants*;" and in the same year there is a record of the Queen granting an annuity of £20. to a Mr. Preston, who performed before her Majesty at Cambridge. Killigrew, after the Restoration, collected together a few of the old actors at the Cockpit, or Drury-lane Theatre, who were honoured with the title of "His Majesty's Servants;" wherefore the company of that theatre is to this day exclusively styled "Their Majesties' Servants."

Why are performances of sacred music called Oratorios?

Because they commenced with the fathers of the oratory; when, to draw youths to church, they had hymns and sacred stories, written in dialogue, and set to music. After the first part came the sermon, which the people were induced to stay and hear, to be present at the performance of the second part. The subjects, in early times, were the Good Samaritan, Prodigal

Son, Tobit's Story, &c.; and by the excellence of the composition, the band of instruments, and the performance, the Oratory came into great repute; and this species of musical drama obtained the general appellation of *Oratorio.—Dr. Burney.*

Why were masquerades originally unpopular in England?

Because they were first introduced here by the queen of Charles I, on a Sunday, when the populace loudly complained of such a profanation of the sabbath; and a riot ensuing in front of the banqueting house, Whitehall, between some soldiers and the people, half a dozen of the latter, and two or three guards were killed. Hence, opposition to masquerades was very general for nearly a century.

Why have actors been, by illiberal persons, called vagrants?

Because they are so described in the Act of Parliament 17 Geo. II, c. 5. This act has, however, expired, and thanks to the improved intelligence of the age, players are not enumerated in the new Vagrant Act, 5 Geo. IV, c. 83.

Why does the licensing of plays appear to be of very ancient date?

Because, so far back as the year 1589, "Commissioners were appointed for reviewing the works of dramatists, to allow the fit and reject the unbecoming." Sir Robert Walpole's Licensing Act was passed chiefly through a libellous, political farce, which Giffard, a manager, sent to that minister; but theatres and plays had been subject to the control of a licensing power, under the Master of the Revels, or Lord Chamberlain, from before the time of Elizabeth at least. The licensing officer granted or prohibited, as he pleased, license for theatre or play; and from such plays as he licensed, he expunged every passage which appeared to him objectionable. His fee for a play had originally been a mark, but, in 1630, it was £2. It is now £2. 2*s.*—*Hist. Theatres*, 4to. 1824.

Why is Opera one of the most perfect of entertainments?

Because it is a dramatical, lyrical, and scenic representation, in which agreeable sensations are conveyed by the combined effect of all the *fine arts*—the poetry and action being addressed to the mind, the music to the ear, and the scenic decorations to the eye of the spectator.—*Rousseau.*

Why was the pantomime of the ancients superior to that of our times?

Because it was a perfect species of mimetic or imitative dance, united with vocal and instrumental music, in the chorusses of the tragic, comic, and satiric dramas; and being employed in the service of religion, it thereby acquired a dignity which in modern times it never possessed. Plato and Xenophon, in the person of their master, Socrates, speak favourably of this entertainment; and Aristotle expressly ranks it with the art of poetry. Plutarch eulogized it; and Lucian prefers the orchestral to the speaking dramas. "The Greeks," says Athenæus, "had brought their dance to such perfection in the art of imitating the passions, that the most eminent sculptors thought their time not ill employed in studying and designing the attitudes of the public dancers; and to this study," he adds, "they owed, undoubtedly, some of the most transcendent beauties of their works." At Rome, under Augustus Cæsar, the great heroes of pantomime were Pylades and Bathyllus; so distinct were the styles of these two dancers, that, according to Seneca, neither Pylades in comedy, nor Bathyllus in tragedy, could be reckoned comparable to themselves.

Why, in the accounts of these performances, is not the expression and action of the countenance mentioned?

Because the performers wore masks, which the vast extent of the ancient theatres made expedient rather than offensive. In all these dances, likewise, the motions of the hands and gestures of the body were no less essential than the pulsations of the feet.

It is uncertain whether the Egyptians understood theatrical entertainments; but remains of their monuments prove them to have been accustomed to conceal their faces with masks, which were originally made of bark of trees, then of leather, subsequently of wood, and of paper varnished. At what period the black silk vizor came into fashion, we know not; but masks of black velvet were commonly worn in France in the time of Louis XIV. Female masks were worn by boys, who formerly played women's parts on our stage.

Why, in modern pantomime, is the harlequin so called?

Because, in the time of Henry III, of France, a young Italian actor being received by the president Achilles de Harlai, at Paris, his brother actors called him *Harlequin.* Another derives it from a knight named Harlequin, in the wars of Charles Martel against the Saracens. The present character of harlequin, as he appears in England, differs from the ancient mimes and harlequins of other nations. The French harlequin bears a wand, and the usual costume; but he does not use the former. Among the Italians, their harlequin is a complete buffoon, who cracks his jokes to amuse the populace, and ranks with punch, monkeys, and puppets; but in England he is a silent, mysterious, and magical being.

In Venice was formerly an inimitable actor, and *speaking* harlequin, named Sacchi, who performed in a comedy called *The Thirty-two Misfortunes of Harlequin,* when upwards of 70 years of age. The Venetians have likewise favourite pieces called Four Masques; Pantaloon, a rich old merchant; an old Dottore, or cunning Bologna lawyer; Harlequin and Brigella, servants; all of which nearly correspond with our pantomime characters.

Lord Byron, in his notes to *Childe Harold*, says, Pantaloon is from *Plant the Lion*, that is, the Lion of St. Mark, the standard of the Venetian republic, Thus, Piantaleone, Pantaleon, Pantaloon.

Why was the clown introduced into our pantomimes?

Because of his origin from the rural jester. The fool was indeed the inmate of every opulent house, but the rural jester, or clown, seems to have been peculiar to the country families. Douce says, "the term *clown* and *fool* were used, though improperly, perhaps, by our old dramatists."

Why is it supposed that moveable scenes were not in use till after the year 1605?

Because three plays then performed at Oxford, before James I, are thus described by a contemporary writer:—"The stage was built at the upper end of the hall, as it seemed at the first sight; but, indeed, it was but a false wall, faire painted, and adorned with stately pillars; which pillars would *turn about;* by reason whereof, with other *painted clothes*, the stage did vary three times in one tragedy." It is observable, that the writer was not acquainted with the word scene, but employed *painted clothes* in that sense. In the early part of Shakspeare's time the want of scenery was supplied by writing the names of the different places of action on boards, which were placed so as to be visible to the audience. Davenant, in the Introduction to the *Siege of Rhodes*, 1656, says, "In the middle of the frieze was a compartment, wherein was *written* Rhodes." The scenery of 1605, above mentioned, was contrived by Inigo Jones; and in 1675, Davenant produced an opera at Dorset Gardens, with "expensive scenery."

Why are theatrical scenes liable to pay a heavy duty?

Because, the Barons of Exchequer have decided them to be painted canvass, precisely the same as floorcloth.—*Edinb. Review.*

Why are scenes painted chiefly in water colours?

Because they present no glossy surface, and are to be subjected to a strong artificial light.

Why should the actor remain as little as he can at the back part of the scene?

Because the perspective will otherwise be often violated: thus, all those objects placed there, which, whilst the performer kept in front (where every thing is suited to his actual size) appeared in due proportion, lose their verisimilitude, and appear insignificant and disproportioned. The man becomes as tall as the rock or tree, and the imagination of the spectator has not power sufficient to preserve the illusion.

Why were soldiers first stationed at the theatres Royal?

Because of a riot between Quin and a party of drunken noblemen, at Lincoln's Inn Fields theatre, in the reign of George II.: and, to prevent the recurrence of which outrage, his Majesty ordered that the guards should in future do duty every play night.

Why are large placards called posting bills?

Because plays were originally announced by large bills pasted on posts at the corners of streets. Taylor, the water poet, alludes to this custom:—"Master Nat. Field, the player, riding up Fleet-street at a great pace, a gentleman called him, and asked him what play was played that day. He, being angry to be staid on so frivolous a demand, answered, that he might see what play was plaied on every poste. 'I cry your mercy,' said the gentleman, 'I took *you* for a *poste*, you rode so fast.'"

Why is "Vivant Rex et Regina" affixed to the bills of the present day?

Because of its adoption on the opening of Drury-Lane, in 1663, when likewise the actors' names were, for the first time, affixed to the characters they represented. Printing in black and red lines, alternately, was adopted in Cibber's time.

Why is our stage sometimes covered with green cloth?

Because, either of its origin from the stage being formerly strewed with rushes, the usual covering of floors in Shakespeare's time, or, from the custom of hanging the stage with black, when tragedies were performed:

> Look, comedie, I mark'd it not till now,
> The stage is hung with black, and I perceive
> The auditors prepar'd for tragedie.
>
> *Induction, or Prologue*, 1599.

Goldsmith humourously calls this "spreading the cloth for bloody work."

Why are dramatic entertainments natural to man?

Because all children delight in mimicking action; many of their amusements consist in such performances, and are in every sense *plays*. When they are not engaged with their hoops, tops, and balls, or in some artificial game, they amuse themselves in playing at soldiers, in being at school, or in church, in going to market, in receiving company; and they imitate the various employments of life with so much fidelity, that the theatrical critic, who delights in chaste acting, will often find less to censure in his own little servants in the nursery, than in his Majesty's servants in a theatre royal. When they are somewhat older, they dramatise the stories they read: most boys have represented Robin Hood, or one of his merry men, and every one has enacted the part of Robinson Crusoe and his man Friday.

In short, because the true enjoyment of life consists in action; and happiness, according to the peripatetic definition, is to be found in energy; it accords, therefore, with the nature and etymology of the drama, which is, in truth, not less natural than agreeable.—*Edinburgh Review.*

Why were puppets first introduced?

Because probably of the poverty of the strolling actor, who thus endeavoured to supply the place of his human confederates by automaton figures made of wood, and moved by wires; and these contrivances, Mr. Strutt thinks, were taken from the automaton of the monkish miracle workers, at the famous rood or crucifix, at Bexley, in Kent, &c. The jack of the clock-house was also an automaton that struck the hours on the bell in their proper rotation, like the figures which, till very recently, were to be seen at St. Dunstan's church, in Fleet-street.

Why is the puppet, Punch, so called?

Because of its origin from Pulcinella, or Punchinello, which first came into existence at Acerra, near Naples.

Why was Punch formerly so celebrated in England?

Because of his frequent mention by Sir Richard Steele in the *Tatler* and *Spectator*, about the year 1711 and 12. Bickerstaff mentions "a thread in one of Punch's chops," which shows a method of performance and a degree of intricacy in the machinery not now known. At present the puppets are played only by putting the hand under the dress, and making the middle finger and thumb serve for the arms, while the fore-finger works the head. The opening and shutting of the mouth is a refinement which does not seem to be practised in Italy.

Why is Punch taken away by the Devil at the end of the puppet-show?

Because in the moralities, from which this puppet is taken, the devil usually carried away the iniquity or evil at the conclusion of the drama.—*Strutt.*

Why did puppet-shows fall into disrepute?

Because of the revival of pantomimes, in which all the absurdities, except the discourses, are retained, the difference consisting principally in the substitution of living puppets for wooden ones.—*Strutt.* The *Fantoccini* is no more than a well managed and dressed puppet-show, with a fine Italian name.

MINSTRELS.

Why were minstrels so called?

Because of their origin from the ancient Saxon gleemen, subsequently called *ministraulx*, a term well known in Normandy some time before. An eminent French antiquary says, that some of the minstrels composed themselves the subjects they sang or related. Strutt adds, it is very certain, that the poet, the songster, and the musician were frequently united in the same person.

Fiddlers and ballad-singers are the last relics of minstrelsy in this country. The name of fiddlers was applied to the minstrels as early as the fourteenth century, and in an ordinance of Cromwell we read "fiddlers or minstrells."

Why was the king's minstrel so called?

Because, in the Norman courts, he accompanied his master, and was probably the regulator of the royal sports, and appointed the other minstrels belonging to the household. The title king was dropped in the reign of Edward IV. and that of serjeant substituted. Hence, probably, the claim of the king's serjeant-trumpeter to grant music licenses in London and Westminster.

Why were jestours, or gestors, so called?

Because they related the gestes or actions of famous persons, whether fabulous or real, and these stories were both to excite pity and laughter, as we learn from Chaucer:

And jestours that tellen tales
Both of wepying and of game.

Jesters, in the modern acceptation of the term, were inferior minstrels.

Why was the juggler so called?

Because of his origin from the joculator, or jugglour of the Normans.

The king's juggler was anciently an officer of note in the royal household book. In the 12th century, the title of *rex jugulatorum*, or king of the jugglers, was conferred on the chief of the company. In the reign of Henry VII, the office of king's juggler was discontinued.

With the minstrel also fell the juggler, the latter being modernly called a hocus pocus, and now dwindled to the conjurors at fairs.

DANCING.

Why is rope-dancing believed very ancient?

Because of its mention by Terence, in the prologue to Hecyra, where he complains of the attention of the public to a rope dancer. Rope-dancing was also among the minstrels' entertainments, and one of its feats was exhibited at the coronation of Edward VI.

The Morris Dance has already been noticed at p. 26, Part III. of the present work.

Why were female dancers called tumbling-women?

Because tombesteres, or tombasteres, in Chaucer, is derived from the Saxon word *tombau*, to dance, vault, or tumble. The same poet, in the *Romance of the Rose*, calls them saylowrs, or dancers, from the Latin *salio, to leap;* and *sauteurs*, leapers, in French.

Tumbling was fashionable at the Opera House, in 1709, and is mentioned in one of the *Tatlers* of that year.

Why is the sword-dance so called?

Because it is performed by young men, who form their swords into a figure, lay them upon the ground, and dance round them.

Why is dancing recommended in early education?

Because it gives a graceful motion to all our limbs, and, above all things, manliness, and a becoming confidence to young children, which cannot be learned too early. Nothing appears to give children so much confidence and behaviour, and so to raise them to the conversation of those above their years, as dancing.—*Locke's Treatise on Education.*

Why are all men natural, spontaneous, involuntary dancers?

Because of the connexion that exists between certain sounds and certain motions of the human body. Even between inanimate objects and certain notes there is a surprising sympathy. The most massive walls, nay, the solid ground itself, will responsively shake and tremble at particular notes in music. This strongly indicates the presence of some universally diffused and exceedingly elastic fluid, which is thrown into vibrations by the concussions of the atmosphere upon it, produced by the motions of the sounding body. If these concussions are so strong, as to make the large quantity of elastic fluid vibrate, that is dispersed through a stone wall, or a considerable portion of the earth, it is no wonder they should have the same effect upon that invisible and exceedingly subtle matter, which pervades and seems to reside in our nerves.—*Ency. Brit.*

Why are there various dances among different nations?

Because (it is conjectured) all the sensations and passions to which we are subject, depend immediately upon the vibrations excited in the nervous fluid above mentioned. One kind of vibration, for instance, excites the passions of anger, pride, &c. which are paramount among warlike nations. The sounds capable of such effects would naturally constitute their martial music, and dances conformable to it would be simultaneously instituted. Other vibrations of the nervous fluid would produce the passions of love, joy, &c.; and sounds capable of exciting these particular vibrations will immediately be formed into music for dances of another kind.—*Encyc. Brit.*

Why are barbarous people most addicted to dancing?

Because they have the strongest passions, and are the most easily affected by sounds.

Why is dancing believed to have been originally a religious ceremony?

Because of its frequent mention in the sacred festivals of the Jews. Some commentators are of opinion, that every psalm had a distinct dance appropriated to it. The Egyptians too had their solemn dances.

Why were military dances practised among the Greeks?

Because they tended to make the body robust, active, and well disposed for all the exercises of war.

Why is the ballet of action so called?

Because in it the performer is both actor and dancer.

Why do ballets so often fail in characteristic expression, which should be their essence?

Because the artists or dancers so often sacrifice the beauties of the dance, and give up the graceful *naïveté* of sentiment, to become servile copyists of a certain number of known and hackneyed figures.—*Noverre.*

Why are speakers unnecessary in a well-composed ballet?

Because a complete ballet is, if the expression may be allowed, a mute conversation, or a speaking and animated picture, whose language consists of motions, figures, and gestures, unlimited in their number, because there are no bounds to the varieties of expression. —*From Plutarch.*

Why is a certain kind of dancing called a country-dance?

Because of its corruption from the French *contre-danse*, where a number of persons, placing themselves opposite one another, begin a figure.

Marshal Bassompierre, speaking of his dancing country dances here, in England, in the time of Charles I, writes it expressly *contre-danse.*

BULL AND BEAR BAITING.

Why were bear-gardens so called?

Because in them were baited bears, with ban-dogs, the spectators standing on a scaffold.

Why were ban-dogs so called?

Because they were bound-dogs, being always kept tied up, on account of, and to increase, their fierceness. These were the dogs formerly kept for baiting bears, and therefore were probably the same as those by which bulls were baited, the true old English bull dogs, than which a dog of greater courage does not exist. From the terrific howling made by such large dogs, they are occasionally introduced in descriptions of night, to heighten the horror of the picture:

> The time when scritch-owls cry, and ban-dogs howl,
> When spirits walk, and ghosts break up their graves.
>
> *Shakspeare, Henry VI.*

Why is bull-baiting erroneously supposed to have been derived from the Moors?

Because had it been established among the Moors before the invasion of Spain, some remains of it would still be found in Barbary, where, however, it does not appear to be known; and the stronger probability is, that it has existed among the Spaniards from a much more remote period of antiquity. The large roofless amphitheatre, the dens communicating with the arena, and much of the ceremonial, are all evidently borrowed from the Romans.—*Beckman.*

Why was bull-baiting first introduced at Stamford?

Because, about the year 1209, Earl Warrenne, lord of the town, standing upon the walls of the castle, observed two bulls fighting, until the butchers' dogs interfered and pursued one of them through the town; which sight so pleased his lordship, that he gave the meadow, where the fray began, to the butchers of the town, to be used as a common after the first grass was mown, "on condition that they should find a *mad bull*, the day six weeks before Christmas-day, for the continuance of that sport *for ever.*"

Why was bull-running practised at Tutbury?

Because, by custom of the manor, since the year 1374, a bull was annually given by the prior of the Abbey to the minstrels, to be run or hunted, and then baited, for the security of certain privileges to the inhabitants. The late Duke of Devonshire, steward of Tutbury, however, abolished this custom, in 1778, upon the petition of the town's-people.

BOWLING.

Why were bowling-alleys formerly common in England?

Because open greens for bowling were inconvenient; and the alleys, being covered over, might be used in all weather, wherefore they were usually annexed to the residences of the opulent. The little room required for these bowling-alleys, was no small cause of their multiplication, particularly in great towns and cities.—*Strutt.*

Hence, also, the origin of long bowling

BILLIARDS.

Why were billiads introduced?

Because of their origin from an ancient pastime resembling bowling; but the bowls, instead of being cast by the hand, were driven with a battoon, or mace, through an arch, towards a mark at a distance from it. "Hence," says Strutt, "I make no doubt, originated the game of billiards, which formerly was played with a similar kind of arch, and a mark called the king, but played upon a table instead of the ground."

Why was the table added to this game?

Because it precluded the necessity for the player to kneel, or stoop exceedingly when he struck the bowl, and accommodated the game to the limits of a chamber.

M. Mingaud has, in a treatise, illustrated, by a series of plates, the possibility of effecting certain strokes at billiards, which a novice would pronounce impracticable. His plates have all the beauty of mathematical accuracy, and they have recently been published, with a translation of his directions, by Mr. Thurston, the celebrated billiard-table maker, of the Strand. From this treatise we learn, that "the first billiard-table known in France was of a triangular form, and was introduced at the château de Blois, during the residence of Henry III." The game is nowhere more common than in France, where maces and balls on the door-posts of *cafés*, denoting that billiards may be played there, are as often seen, as chequers formerly were at the entrance to public houses in England. Strutt and M. Mingaud differ in their opinion of the origin of billiards, the latter attributing it exclusively to the French. Shovel-board is also thought to have given rise to billiards, especially as, in former times, shovel-board tables were common in the great halls of the opulent.

SKITTLES.

Why are skittles so called?

Because they originated from trayles, cales, and keiles, from the French *quilles*, or pins. The trayle-pins were afterwards kettle or kittle-pins, subsequently corrupted to skittle-pins. Kittle-pins were sometimes played with bones, whence, in an old drama, (*Merry Milk-Maid of Islington*, 1680) "I'll cleave you from the skull to the twist, and make nine skittles of thy bones."

DICE.

Why is dice-playing supposed to have been one of the most ancient amusements?

Because it is recorded as one of the earliest pastimes among the Grecians. The ancient Germans, the Saxons, the Danes, and the Normans, were all greatly addicted to this infatuating amusement. An author of the twelfth century, too, speaks of ten different games then in use.

"Dice," says Strutt, "are said to have been invented, together with chess, by Palamedes, the son of Nauplius, king of Nubæa. Others, agreeing to the time of the invention of dice, attribute it to a Greek soldier, named Alea; and therefore say, that the game was so denominated. Herodotus attributes both dice and chess to the Lydians, a people of Asia; in which part of the world it is probable they originated, at some very remote but uncertain period.

CHESS.

Why is chess so called?

Because of its origin from the name of the inventor, but to whom this honour is to be attributed has not yet been, nor probably ever will be, settled. We can only quote a few of the traditions on the subject. One has maintained that it originated from *Ascoches*, famous robbers among the Turks. Father Sunnond seems to give some countenance to this opinion, when he asserts that its name is derived from the German *scache*, which signifies theft. Fabricius is of opinion, that the name is derived from the Hebrew *schach*, which signifies to draw lines of circumvallation, or to fortify. Fabricius says, that it was invented by one Schatreusca, a celebrated Persian astronomer, who gave it his own name, which it still bears in Persia. Nicot derives it from *scheque*, or *xeque*, a Moorish word, which signifies lord, king, and prince. Bochart judiciously observes, that *schach* is originally a Persian term, and that *schachsnut* in that language, signifies that the king is dead. The opinion of Nicot and Bochart appears most probable, and has met with no small support from the posthumous works of the learned Hyde, published by Dr. Gregory Sharp, &c.

Another account ascribes the invention of chess to a Brahmin, in the fifth century of the Christian æra, to convince an ambitious prince that the *king*, though the most considerable of all the *princes*, is both impotent to attack, as well as defend himself against, his enemies, without the assistance of his subjects and soldiers.

The *game* was not long confined to India; it passed into Persia, during the reign of *Cosroes*. The Persians looked upon it as a game to be made use of in all countries, to instruct kings at the same time that it amused them, as the name which they gave it, signifies; *Schertrengi*, or *Schatrgck*, the game of the *Schah*, or *King*.

The chess-board, the number of pieces, and the manner of playing, have undergone but little variation. The great changes have been in the names: thus, the rock, or fortress, we have corrupted into a rook; the bishop was with us formerly an archer, while the French denominated it Affin and Fol, which were perversions of the original Oriental term for the elephant.

The ancient Persian game of chess consisted of the following pieces, which were thus named when they reached Europe:—

1. *Schah*, the King. — 2. *Pherz*, the Vizier, or General.—3. *Phil*, the Elephant.—4. *Aspen Suar*, the Horseman. — 5. *Ruch*, the Dromedary. — 6. *Beydal*, the Soldier.

The French changes were *Schah* into *Roy*, the King; Pherz, the Vizier, became *Ferirè*, *Fierce*, *Fierge*, *Vierge*, and thence lady or *Queen*. The elephant, *Phil*, was easily altered into *Fol*, or the modern *Fou*. Of the horseman, *Aspen Suar*, they made the cavalier or knight. The dromedary, *Ruch*, was changed into a castle, *tour*, or tower; probably from being confounded with the elephant which is usually represented carrying a castle. The foot-soldiers, *Beydal*, were retained by the name of *Pietons*, or *Pions*, whence our pawns.

Draughts, no doubt, is a modern invention.—*Strutt.*

Why is chess considered one of the noblest of games?

Because, in chivalric times, it formed one of the principal amusements of the knight when the season and weather did not permit hawking and hunting. A true knight was a chess-player, and the game was played in every country of chivalry; for as the chivalric states of midland Europe obtained a knowledge of it from the Scandinavians, so the southern states acquired it from the Arabs.

> "When they had dined, as I you say,
> Lords and ladies went to play;
> Some to tables, and some to chess,
> With other games more and less.

The fondness of our ancestors for the game of chess appears by the frequent mention of the amusement in the ancient romances. Sometimes a lover procured admittance to the place where his mistress was confined, by permitting the jailor to win from him a game at chess. Again, the minstrels in the baronial hall, spread over their subject all the riches of their imagination. They were wont to fancy the enchanted castle of a beautiful fairy, who challenged a noble knight to play with her at chess. Flags of white and black marble formed the chequer, and the pieces consisted of massive statues of gold and silver, which moved at the touch of a magic wand held by the player.—*Mills's History of Chivalry*

BACKGAMMON.

Why is backgammon so called?

Because of its origin from two Welsh words, signifying "little battle." Strutt, however, thinks the words are perfectly Saxon, as Bac, or Bœc, and gamen, that is back-game; and so denominated because the performance consists in the players bringing their men *back* from their antagonists' tables into their own; or because the pieces are sometimes taken up and obliged to go back, that is, re-enter at the table they came from.

CARDS.

Why are chess and cards supposed to be from the same source.

Because, in the early cards, we have the king, knight, and knave; and the numerical cards, or common soldiers. The oriental game of chess has also a king, vizier, and horseman, and its pawns or common soldiers; but the parties at cards are doubled; there are four instead of two of each, which is the only variation. There were only thirty-six cards in the original eastern pack; the more complicated one was, undoubtedly, of later invention. "Perhaps," says Mr. Singer, "the English derived their first knowledge of cards from the crusaders, rather than from their continental neighbours."

Why is the game of cards especially a species of combat?

Because four warlike monarchs were chosen for kings; the knaves* (valets) were symbolical of the vassals of feudal times; the other cards refer to the residue of the people of whom the armies were composed. The queen appears to have been introduced by the gallantry of the French.

Why are cards supposed to have given rise to the noble art of printing?

Because, when card playing became a general pastime, the increasing demand for cards suggested the idea of cutting the outlines of the different suites, and stamping them upon the cards, the intermediate spaces between the outlines being filled up with various colours laid on by the hand.

These printing-blocks are traced back to the year 1423, and probably were produced at a much earlier period.—*Strutt.*

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* Knave formerly signified valet or servant, as appears from Wickliffe's New Testament, kept in the Westminster Library and where we read, "Paul, the knave of Jesus Christ."

Why were cards once supposed to be of French origin?

Because the *fleur-de-lis* is to be found in every court-card; but they are likewise found among the ornaments of the Romans at a remote period; on the sceptres and crowns of the emperors of the west, in the middle ages, and on those of the Kings of England before the Norman conquest. The earliest cards, moreover, of which specimens are extant, do not bear this mark of French origin.

Why were cards supposed to be of Spanish origin?

Because that language has supplied the names of the cards, and of many of the most ancient games; such as primero, and the principal card in the game, quincola; ombre, and the cards spadille, manille, basto, punto, matador, quadrille, &c. The suit of clubs upon the Spanish cards, is not the trefoil, as with us, but clubs or cudgels, of which we retain the name, though we have lost the figure: the original name is bastos. The spades are swords, called in Spain spadas; in which instance we retain the name, and some faint resemblance of the figure. These being proofs of adoption, rather than invention, Mr. Singer surmises that the Spaniards derived their knowledge of cards immediately from the Moors.

Why is the trump-card so called?

Because of its origin from the *triunfo* of the Italians, and the *triomphe* of the French, from its being an advantageous card. A game of this name was once very common.

Why are the figured cards called "court-cards"?

Because of the corruption of *court* from *coat*, or the dress of the figure on the card. In an old play, by Rowley, one says, "I am a *coat*-card indeed;" he is answered, "Then thou must needs be a knave, for thou art neither king nor queen."

Why was ombre played at three-cornered tables?

Because the players, three in number, might be uninterrupted, the game requiring great attention and quiet; whence its name, from *Il Hombre*, (or, the man) "on account of the deep thought and attention it requires, which render it a game worthy the attention of man." Quadrille, another species of ombre, was very popular in England, until whist began to be played upon scientific principles.

Why is the game of whist so called?

Because it requires strict silence; thus, *whist!* that is, *be silent.*

Why is "love," (as "six or nine love") employed at whist.

Because of its origin from the old Scottish word of *luff*, or hand; so that *six luff* will mean so many in hand, or more than the adversary.

Why is the nine of diamonds called "the curse of Scotland"?

Because every ninth monarch of that nation was a bad king; and not, as is generally supposed, because the Duke of Cumberland, the night before the battle of Culloden, accidentally wrote his orders for refusing quarter upon the back of this card.—*Singer.*

END OF PART VI.

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